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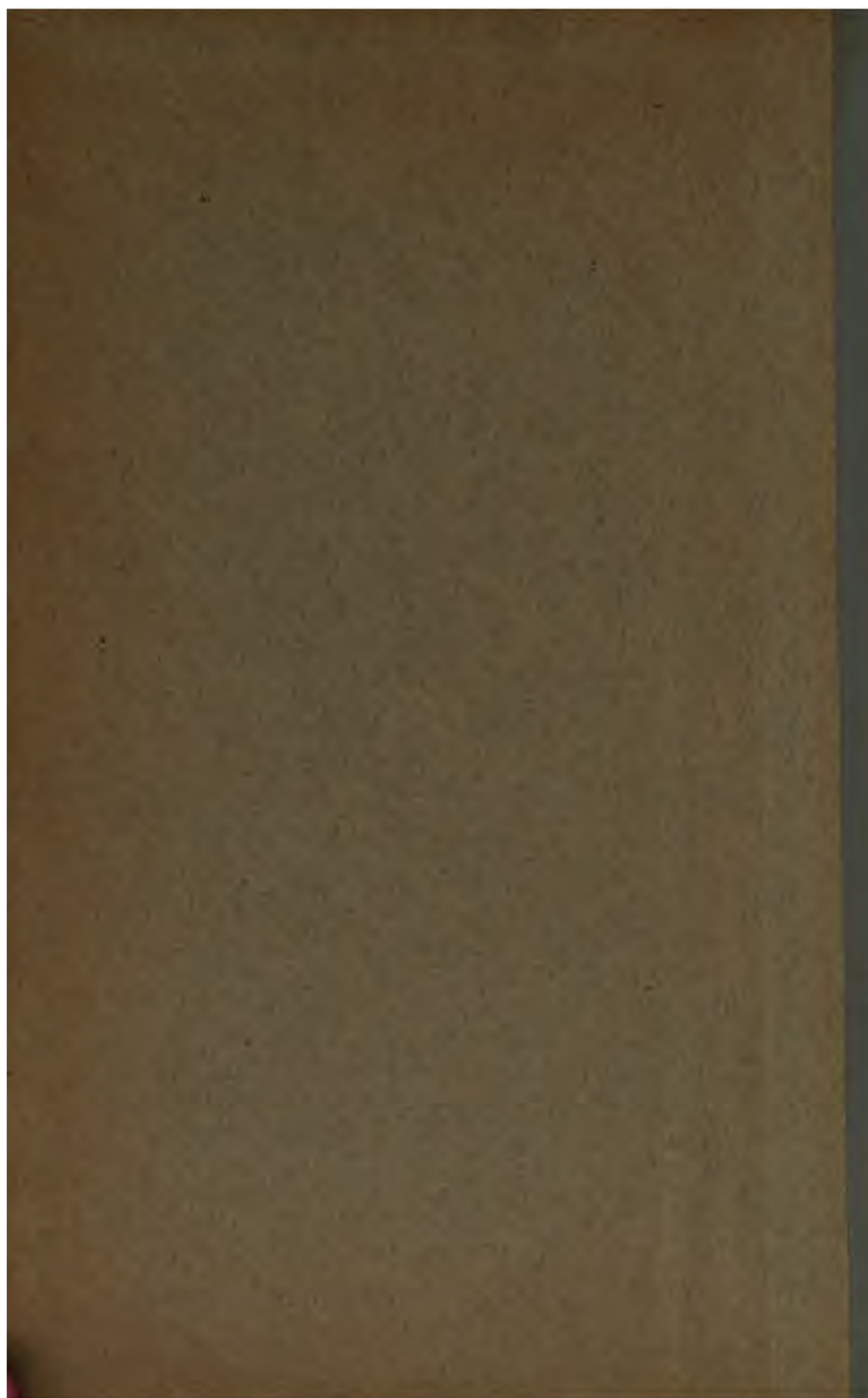
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ANNUAL REPORT

OF THE

LOCAL BOARD OF HEALTH

FOR THE

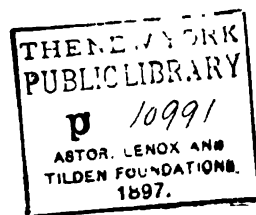
YEAR 1896.



TORONTO:

THE CARSWELL CO. (LTD.), CITY PRINTERS, 22 ADLAIDE ST. EAST
1897.

Presented by City Clerk.



ANNUAL REPORT

OF THE

Local Board of Health

FOR THE

YEAR 1896.



TORONTO:

THE CARSWELL CO. (LTD.), CITY PRINTERS, 22 ADELAIDE ST. EAST

1897.

ROY VAN
JULIEN
VANDER

ANNUAL REPORT
OF THE
LOCAL BOARD OF HEALTH
FOR THE YEAR 1896.

To the Chairman and Members of the Local Board of Health :

In compliance with the provisions of the Statute, I beg to report to the Board the sanitary work done during the year now about closing, and also the sanitary condition of the City, as shown by the minute book in which are recorded the proceedings of the Local Board of Health of this City.

During the year the Board held several important meetings, and the attendance thereat by the members has been exceptionally good.

SUNDAY DELIVERY OF MILK.

The first question considered by the Board this year was a resolution passed by the City Council requesting the Board to consider the advisability of bringing in a By-law to regulate the delivery of milk on Sundays during the winter months.

The Board, after giving the matter due consideration, ordered a report to be forwarded to the Council expressing the opinion that it had not the power to interfere with the question of the Sunday delivery of milk.

ESTIMATES.

The estimated expenditure of this department for year 1896 was submitted by the Medical Health Officer

to the Board at its first meeting, and being considered satisfactory, was passed, and ordered to be forwarded to the Council with the request that the necessary funds be provided.

The estimated expenditure was as follows:

Medical Health Department	\$16,733 13
Isolation Hospital	10,878 86
Total	\$27,611 99

In consequence of the transfer of the Plumbing Department connected with the City Engineer's Department and the Inspection of Food, formerly connected with the License Department, to the Medical Health Department, the Medical Health Officer reported that it would be necessary to provide the sum of \$1,300 for food inspection and \$1,500 for plumbing inspection in addition to the general estimates already approved of by the Board, which report was adopted, and the Council was requested to provide the additional funds.

INSPECTION OF DAIRY CATTLE.

The Medical Health Officer submitted a very exhaustive report on the result of an inspection of dairy cattle, dairy farms and places from which milk is shipped to the City from without the City limits. The result of the inspection went to show that the milk cows in the vicinity of Toronto are in a very good condition, and, with the exception of occasional carelessness so far as the personal cleanliness of the cow, or the udder of the cow is concerned, there has been little cause for complaint.

PLUMBING AND FOOD INSPECTION.

In consequence of the transfer of the above named works to the Health Department, the Medical Health Officer reported that he had made satisfactory arrangements for carrying out the same.

HOUSE TO HOUSE INSPECTION.

The annual house to house inspection was carried out as usual early in the spring, and with a view to improving the sanitary condition of the City orders were given for a thorough cleaning up of all premises throughout the City generally.

DOWN TOWN ACCIDENT WARD.

This important question was referred to the Medical Health Officer for a report thereon, and the report of that officer, which is as follows, was adopted:

"In compliance with your instructions given me at the last meeting of the Local Board of Health, 're the establishment of a down-town accident ward in connection with the General Hospital,' I desire to state that I have conferred with the Hospital authorities upon the matter, and after investigating the number of accidents and emergency cases which have occurred within the central portion of the City, and which have been sent to the Hospital, I am of the opinion that as these have considerably diminished during the past year, possibly on account of the enactments providing against accident required by the Factory Act and also from other influences, that there is no immediate demand at present for the establishment of such emergency ward.

"The Toronto General Hospital has in its building a perfectly equipped emergency ward, which is doing excellent service, and which I think will be sufficient to meet present requirements. At the same time I believe the Hospital authorities are perfectly willing to undertake such work, and provide for the establishment and conduction of a down-town accident and emergency ward when the Municipal Council shall consider it necessary and advisable to order the establishment of the same."

DIPHTHERIA.

During the month of May there were threatened outbreaks of diphtheria in the vicinity of some of the public schools, in consequence of which several classes were closed upon the advice of the Medical Health Department.

Prompt measures were taken by the Department, and they did not expect the occurrence of any more cases in the locality of these schools.

TYPHOID.

The Medical Health Officer informed the Board that the slight increase above the average in the number of typhoid cases for the month of September was not occasioned, in his opinion, by the character of the City water—the bacteriological analysis of the water being satisfactory for that period of the year.

ISOLATION HOSPITAL.

The work at this hospital has progressed quietly and effectively, and the staff at that institution have carried out their duties to the satisfaction of all concerned.

ICE.

Very little difficulty was experienced this year in procuring a supply of first-class ice, such as is necessary for domestic use. The same regulations for the cutting and storing of ice as were in force last year were again put in operation, and worked satisfactorily.

HOUSES UNFIT FOR HABITATION.

A few houses were found to be unfit for habitation, and the Medical Health Officer was requested to have the same closed up.

ISLAND.

The sanitary condition of the Island has been considerably improved, owing chiefly to the improved system of collecting and disposing of garbage. Very few complaints were received from those visiting the Island during the warm weather.

SANITARY CONDITION OF THE CITY.

The sanitary condition of the City, as appeared from the monthly reports of the Medical Health Officer, has been exceptionally good during the year.

The report of the Medical Health Officer is annexed hereto, in compliance with the provisions of the Statute in that behalf. It shows the work done by his Department during the year.

In conclusion, I have again to thank the members of the Board for their kind assistance during the year.

Your obedient servant,

JOHN BLEVINS,
City Clerk and Secretary of Local Board of Health.

REPORT
ON THE
SANITARY CONDITION
OF THE
CITY OF TORONTO

ALSO AN
Account of the Operations of the Board of Health
and the Vital Statistics

FOR THE YEAR 1896

BY
CHARLES SHEARD,
Medical Health Officer.

BOARD OF HEALTH FOR TORONTO,

. . 1896 . .

ALDERMAN ALLEN, *Chairman.*

HIS WORSHIP THE MAYOR.

ALDERMAN CRANE.

" J. J. GRAHAM.

" JOLLIFFE.

" ROWE.

" SAUNDERS.

R E P O R T
ON THE
Sanitary Condition of the City of Toronto
ALSO AN
ACCOUNT OF THE OPERATIONS OF THE BOARD OF
HEALTH AND THE VITAL STATISTICS
FOR THE YEAR 1896.

TORONTO, December 1st, 1896.

To the Chairman and Members of the Local Board of Health :

Gentlemen,—I have the honor to transmit herewith the Annual Report for the Departmental year 1896, which is in a measure a resume of the monthly reports already submitted, and a summary of the year's work. The methods of quarantine and isolation of patients, and disinfection of premises, as outlined in former reports, have still been continued and adhered to, and the returns from the various branches of work in the Department for the year which is concluded shows a close parallelism with previous records.

In considering the sanitary condition of a city proper acknowledgment must be given to the means by which this condition is to be attained. The collection and disposal of garbage, the cleaning of the streets, the disposal of night soil, excreta and sewage are of the utmost importance, and a too rigid economy urged in connection with the Scavenging Department may sometimes operate in necessitating an increased degree of expenditure in other departments which depend to some degree upon cleanliness. Dirty streets and lanes, foul cess-pools, catch basins and sewers exert a powerful pre-

disposing influence which deteriorates in a general way the constitutional vitality, and thus renders such debilitated individuals liable to the attacks of contagious disease.

In the City of Toronto, I am happy to say, the great bulk of the garbage is cremated, the City being supplied with an eastern and western crematory, which are doing excellent work from a sanitary standpoint. Combustion is the only satisfactory and effectual means of disposing of fermentable or putrefactive garbage, while at the same time it removes the danger incident to the occupation of garbage ground by building sites. It has been shown that decomposition continues in such localities for many years after the filling-in process has been completed.

In the City of Toronto, during the past two years, we have had the somewhat general experience of having the high-level portions of the City more affected by diphtheria and typhoid than the low levels. The direct cause of this condition, so commonly seen in cities, is, in my opinion, not yet definitely determined.

When considering the dissemination of contagious disease, one must necessarily take into account the influence of schools. The class-room is the focal point of meeting for children of similar ages, constituting thereby a ready means for the spread of infectious disease.

The Health Department has to thank the school authorities for their hearty co-operation and assistance in the reporting of suspected cases of contagious disease existing among their pupils. Notices are supplied to the Health Department, and an inspector is at once sent to investigate the ground of complaint. If a medical man is in attendance he is communicated with. If the family are too poor to command the services of a medical attendant, one is supplied from the Health

Department. In the event of such investigation confirming the original suspicion, prompt measures are adopted to prevent the entrance of members of the family into the school or schools. In cases of threatened epidemics, where a number of pupils are attending one class or division of the school, that class or division is closed, and if such closure is not sufficient to materially curtail the extension of the disease among the pupils, the entire school is closed.

In threatened epidemics, in circumscribed localities, it has been found of service to communicate with the school teachers of the district, and obtain from them a list of their absentees, in order that the homes may be inspected, and the actual cause of absence from school determined. By such methods disease in its incipency becomes detected. Cases which might not otherwise be reported become known at once to the Department, and the salutary results of such work is immediately manifested. It is necessary to impress upon the public the fact that the school class-room contaminates through direct contagion of pupil with pupil, and it must not be considered evidence of unsanitariness in the school to find a number of the pupils affected with contagious disease. Children of the same age, sitting at the same desk, interchanging the same working material, playing together in the same room or yard, and communicating in the methods peculiar to child life, constitute in themselves potent agencies in the spread of disease.

During the last six months we have had operating in the Province of Ontario the recent amendments relative to the registration of deaths, and the issuing of burial permits. So far as my observations have gone in reference to the matter, I consider the modifications in connection with the Burial Act most important and beneficial. It brings within the knowledge of the Health Officer every death from contagious disease, or

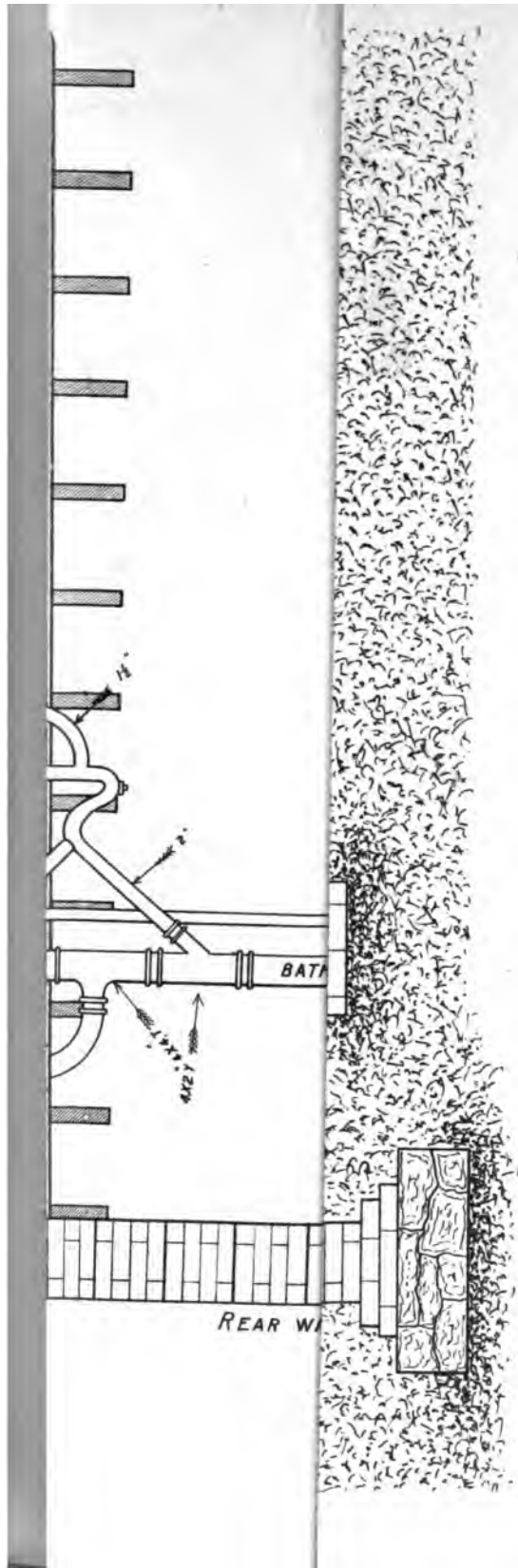
suspected contagious disease, occurring within his municipality. It renders next to impossible neglect in reporting severe cases, for should the medical attendant from various reasons not wish to report such case, the possibility of a fatal termination would place him in a very serious and awkward position. It renders possible the control of the funeral by the Health Officer, insuring the strictest privacy at such obsequies, besides preventing the transmission of infected bodies from one town to another.

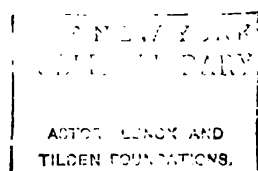
PLUMBING AND DRAINAGE.

The sanitary condition of the plumbing and drainage of houses is an important question constantly forcing itself upon the attention of the Health Officer.

A building with an imperfect plumbing and drainage system is no longer an asset, but rather a burden to its owner, and the consideration of the subject is one of such importance that I venture in this report to outline what may be considered the essential requirements of a satisfactory solution of the question. The smallest house should have a water-closet and sink, and, as the building increases in size, the conveniences should also increase, provided they are justified by the demand. Such accommodation may include bath, wash-basins, laundry tubs, pantry and slop sinks and urinals, all of which should be supplied with a plentiful supply of hot or cold water as required. Each fixture should be placed in such a position that it can be readily cleaned, and should not be located in a room which is not in communication with direct light and air. Consideration should also be given to the question of convenience to adjoining rooms. Laundry tubs, for instance, should be placed where access to drying space is easy, and kitchen sinks where light and room are plentiful. Plumbing fixtures should not be placed in a sleeping room;







neither should any building have in it a fixture that is not likely to be used, as there is danger of its traps becoming dry from evaporation, with consequent escape of sewer gas.

Having first had the private drain from the sewer to the street line constructed, it is then possible to know at what depth a house drain is to commence, and also at what depth it is to be finished, so that the fall or grade for each length of pipe can be accurately determined. It is then necessary to ascertain what carrying capacity certain sized pipes will have with the grade we have at our disposal. A drain larger than is absolutely required is not an advantage, inasmuch as drain pipes are the better for being thoroughly flushed.

The trench to receive the drain should be commenced at the street line, and carried directly, or as nearly straight as possible, to the various fixtures and rain-water leaders. The trench should be roughly graded at first, but, before pipes are laid, it should be accurately cleaned off, care being taken that no more earth is removed than required to give the proper grade. It should next be determined where the hubs of the pipes will rest, and enough earth should be excavated from under such points as to allow the straight portions of the pipes to rest firmly upon the earth. In cases of newly-made earth or running sand a plank should be used, or a bed of concrete.

The trench should be made at least 18 inches wider than the size of the pipe, so as to permit of a man walking up the excavation without stepping upon the pipe. Where tiles are used they should be of vitrified clay, thoroughly glazed inside and out; smooth internally, and as cylindrical as possible.

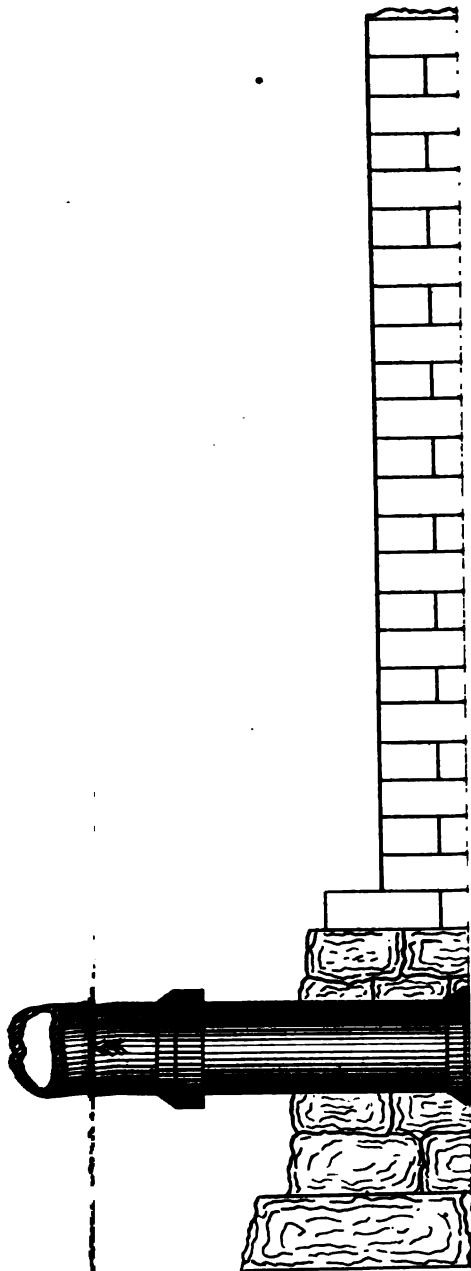
All branches, or changes in direction, should be made by full Y's and necessary curves; no right-angle junc-

tions should be used, and all bends should be as open, and at as great an angle as circumstances will permit. All traps should be perfectly sound, and have a sufficient seal.

It might be advisable to have a trap of at least three inches between the bottom of the pipe and the top of the water seal, thus giving solids passing down the drain sufficient momentum to carry them past the bridge of the trap. All main traps should have at least a $1\frac{1}{2}$ inch seal.

In laying the trap a proper hole, or trap-pit, should be excavated, so that the bottom of the trap may rest securely. Usually the main trap is placed at the street line, and is the first portion of the drain laid on private property. Where the drains are of tile an air inlet is next placed in position, which branch is a T pipe placed on its back. From the centre the drain is run in any required direction to suit the termination of the plumber's work, and the sub-soil water branches in the cellar, and the rain-water leaders outside of the building. The connection for sub-soil drainage is usually made by using a hand-hole running trap for one of the storm-water leaders, and connecting the sub-soil drainage with the hand-hole of the trap. In cases where this trap is situated inside of the building the hand-hole is extended up to the top of the cement floor, and a grating placed over it, which supplies the extra convenience of "a cellar floor wash," the floor being graded to such point.

All storm-water leaders must be trapped. The trap must be on a branch from the main drain; but no trap must intervene between the main trap and the plumbing fixtures. This does not mean that each rain-water leader should have a separate trap; but permits of a number of leaders being so connected as to run through one trap.



[REDACTED]

FOR LINDY AND
[REDACTED]

In laying the pipes care must be taken that the joints are pressed home. Portland or other cement is used, without sand, the joint being filled from the outside and thoroughly trowelled. It might be mentioned that it would be better were the hubs on tile pipes splayed, so that when the pipe is pushed home there will be no difference in the level at the bottom of the pipe, otherwise, unless a great deal of care is taken, a shoulder, large or small, according to the size of the hub, will be left. After the joint is made a scraper should be used to remove any cement that may have fallen inside of the pipe. Where drains pass under or through walls an arch should be turned over them sufficient to protect them from sinking from settling of the wall. Many instances might be given in which the settling of walls has caused serious damage to the drainage system.

After the drain is laid, and terminated at the proper point, it should be made ready for testing. The water test is one which is generally used. All the openings being made level, by placing bends and pipes where necessary, the main drain is plugged at the air inlet with rubber, clay, linseed meal or other suitable stopper. The whole system is then filled with water, care being taken to get all the air out of it. If the drain be tight the water will maintain a constant and uniform level. Should it not do this, it is evidence that a leak exists, which leak will require to be located and made good, and the test again applied. On the drain being proved to be tight, it is next to be determined if it be clear. The usual method of testing this is to pass a ball (generally glass) about $2\frac{1}{2}$ inches in diameter down the drain. By walking along the trench it can be followed, and the location of any stoppage determined. If the ball stops rolling there must be some obstruction, which should be removed. Should the drain have to be broken

in order to remove the obstruction, a second test will be required.

The principal reason for the general use of tile drains appears to be their cheapness and the ease of laying. It must, however, be remembered that a tile drain is often constructed by inexperienced men, and it is easily injured, while in cast-iron pipes the joints occur at every five feet; there is no cement to drop into the pipe; the bore is smooth; the pipe straight, and the joints, being made with lead, make the drain less rigid. An ordinary laborer will not undertake to make a hole in an iron pipe to secure connection. Cleaning screws or fittings can be placed in the drain, so that if it should be choked it can be easily cleaned without excavation. The drain can, if desired, be attached by hangers to the wall of the cellar, where it can be readily inspected at all times. Cleaning screws should be placed at such points in iron drains that rods can be passed through the drains with as little trouble as possible.

PLUMBING.

The drains having been put in a satisfactory and sanitary condition, and properly tested and filled in, the next thing to be done is to locate the plumbing fixtures. In this no more pipe is to be used than is absolutely necessary, so that it may be thoroughly flushed. The soil pipe is placed in position, running as straight as possible up to and three feet above the roof, and away from all openings of the house or building, leaving fittings to receive wastes from various fixtures, care being taken that no right-angle junction is used on other than vertical pipes. Should it be necessary to insert into a horizontal pipe any waste, a full Y, with the requisite bend, should be used.

Nearly all fixtures are connected to wastes by means of lead. Sometimes traps made of brass, iron or porce-

Fig. 1



TELETYPE UNIT
COMMUNICATIONS
SECTION
FEDERAL BUREAU OF INVESTIGATION
U. S. DEPARTMENT OF JUSTICE
WASHINGTON, D. C. 20535

lain are used. Each plumbing fixture should have its own separate trap, which should be placed as near to the fixture as possible. Care should be taken in selecting a trap that it is smooth inside, of the proper shape, and with a sufficient seal. The shape should be such as will offer the most resistance to siphonage, and, at the same time, not retard the flow through it. The size of the trap should be governed by the amount of water which is to pass through it. From the crown of every trap a vent pipe should be taken, one size smaller than the size of the waste pipe. The object of this pipe is two-fold: first, to act as a break siphon; secondly, as a vent-pipe. The By-law permits this pipe to be of wrought iron, with steam fittings, which, owing to the fact of its being cheaper, is in many cases used instead of cast-iron, brass or lead, but is not so good, owing to its liability to rust, or scale, and which even galvanizing will not entirely prevent. This pipe should commence and continue to rise after it has once left the trap, and it should be so constructed that it cannot act as an overflow for the fixture to which it is attached, in the event of the waste becoming choked. These pipes are usually carried up and connected to the soil pipe above the highest fixture, but in some cases they are carried through the roof independently. Pipes which pass through the roof should not be less than four inches in diameter at the roof line.

There should be a cleaning screw placed in this pipe near the trap, and the pipe should be occasionally examined to see that it is clear. Waste pipes should be straight, and as short as possible, care being taken, where bends or offsets are made, that the bore is not decreased, and that the back of the bend is not reduced in thickness.

All fixtures should be of non-absorbing material, made of a pattern that is easily cleaned, and always left

open, so that, in airing a room containing a closet, all parts of the fixtures will be ventilated.

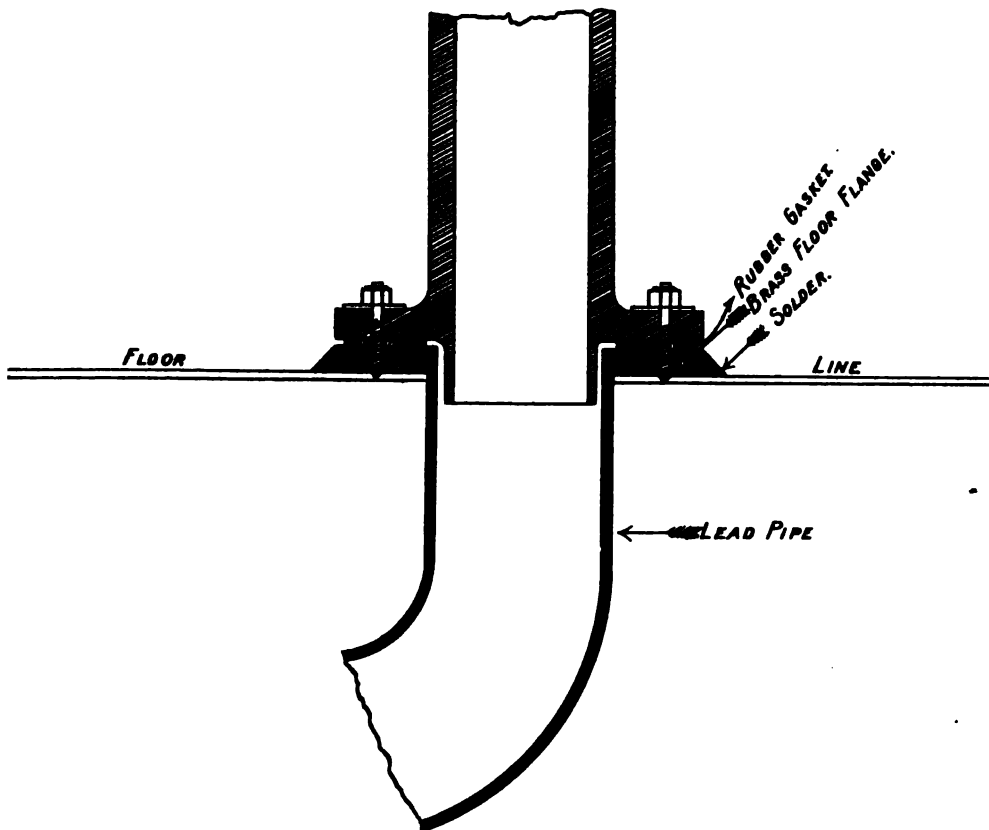
In the case of water-closets, they should be so constructed that all parts will be thoroughly washed each time the tank is discharged; operate as noiselessly as possible; have proper water seal, and retain sufficient water to prevent solid matter adhering to the closet. Each water-closet, slop sink or urinal should have a three-inch, or larger, local vent, properly connected to fixture and terminated in a heated flue.

After the plumbing and drainage systems are completed the smoke test should be applied to see that all connections are tight which have been made since the water test was applied to the rough work of the system.

PLUMBING AND DRAINAGE DEPARTMENT.

Number of Permits issued.

1896.	For Plumbing and Drainage.		For Plumbing only.		For Drainage only.		Totals for 7 Months.	
	Permits.	Buildings.	Permits.	Buildings.	Permits.	Buildings.	Permits.	Buildings.
April....	23	35	20	23	14	16	57	74
May	31	39	19	19	20	21	70	79
June	29	43	18	26	22	28	69	97
July	41	61	15	15	13	13	69	89
August ..	31	43	20	21	8	9	59	73
Sept.....	25	33	18	19	11	14	54	66
October..	39	62	21	23	16	22	76	107
Totals ...	219	316	131	146	104	123	454	585



1000

Number of Inspections Made.

1896.	Plumbing.	Drainage.	Smoke Tests.	Total No. of Inspections.	Notices Issued.
April.....	113	89	50	252	44
May	114	161	57	332	45
June.....	149	214	92	455	62
July	157	159	52	368	56
August.....	198	97	41	336	72
September.....	151	196	51	398	168
October	252	192	68	512	205
Totals.....	1,134	1,108	411	2,653	652

CONTAGIOUS DISEASE.

Diphtheria.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1892 ..	141	182	150	163	141	122	75	41	75	195	174	146	1,625
1893 ..	115	79	100	56	84	57	20	30	21	40	30	42	683
1894 ..	40	28	21	23	25	15	12	11	13	32	37	81	338
1895 ..	81	52	39	33	46	41	34	16	24	38	49	53	506
1896 ..	73	47	47	30	45	37	28	23	25	50	64	93	562

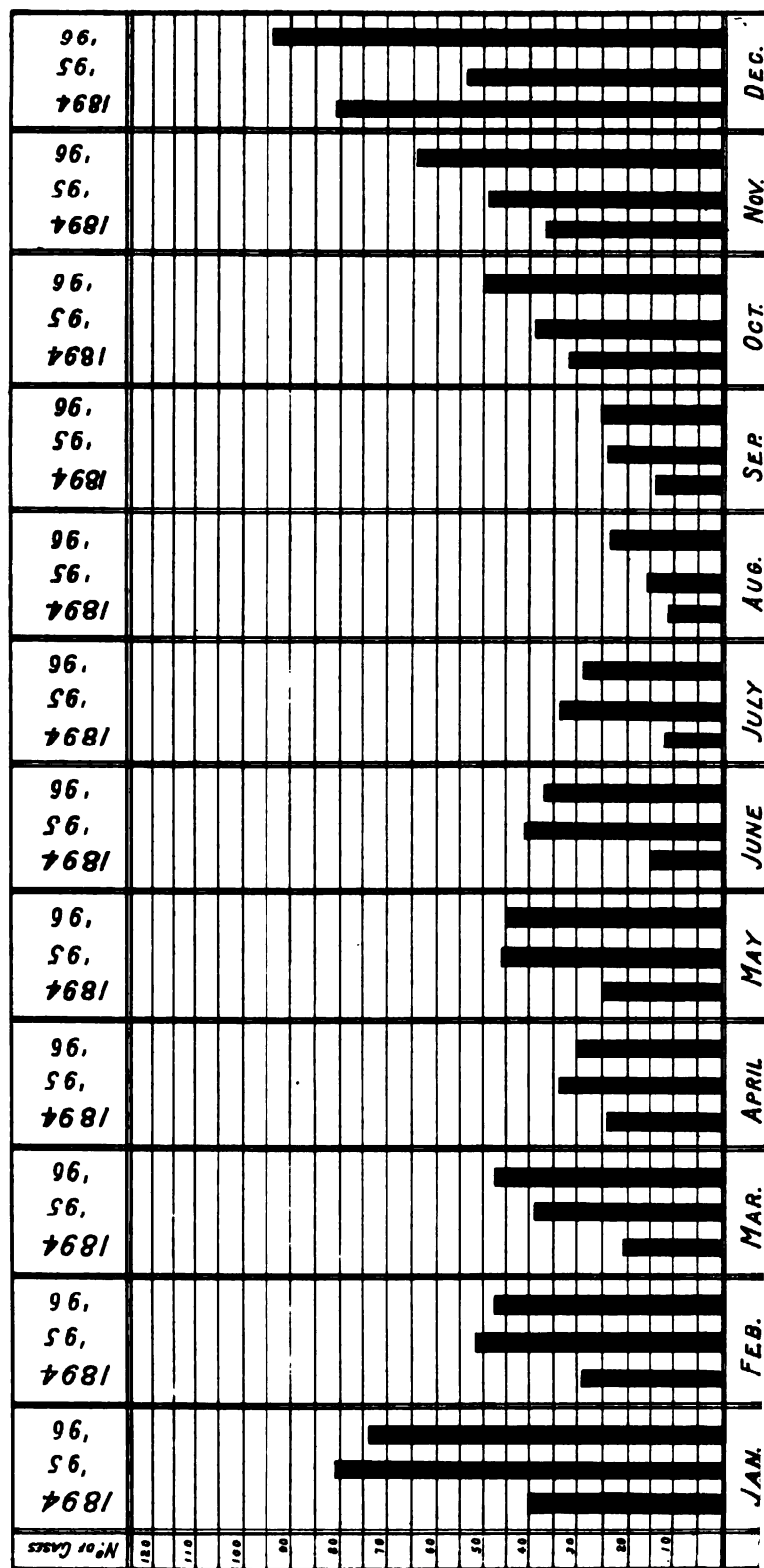
Scarlet Fever.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1892 ..	49	99	74	63	55	47	29	21	38	53	75	68	671
1893 ..	100	70	50	52	77	48	56	29	20	33	35	24	554
1894 ..	28	33	47	34	55	18	25	24	25	29	20	24	371
1895 ..	17	18	14	5	6	7	8	9	6	6	5	12	113
1896 ..	3	8	7	2	3	4	5	3	18	44	44	71	212

Typhoid Fever.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1892 ..	27	16	9	11	25	19	25	57	88	69	49	31	426
1893 ..	35	111	239	43	15	13	6	20	27	27	25	15	476
1894 ..	11	12	7	51	11	6	6	34	38	29	34	10	249
1895 ..	8	15	7	5	5	6	17	37	62	141	47	18	368
1896 ..	12	2	6	10	5	6	25	75	105	56	24	10	334

DIPHTHERIA.



CITY OF TORONTO.

DOTTED LINE = 1894

Red = 35

Black = 36

200
90
80
70
60
50
40
30
20
10
100
90
80
70
60

200
90
80
70
60
50
40
30
20
10
100
90
80
70
60

CITY OF TORONTO.

4681 = EN17 PERIOD

Red 35

Black	n	.	26
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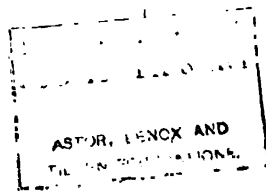


TABLE OF MORTALITY FOR VARIOUS CITIES,

Compiled as far as possible from Health Reports for 1895.

Cities.	Population	Deaths.	Mortality per 1,000 of Population.
London, Ont.....	34,429	385	11.18
Denver, Col.....	145,000	1,626	11.21
St. Paul, Minn.....	140,292	1,629	11.61
Hamilton, Ont.....	50,000	702	14.04
Toronto, Ont.....	196,866	2,986	15.18
Chicago, Ill.....	1,600,000	24,319	15.19
Rochester, N. Y.....	150,000	2,315	15.43
Milwaukee, Wis.....	250,000	3,885	15.50
Brantford, Ont.....	16,332	255	15.56
Windsor, Ont.....	10,000	157	15.70
Cleveland, Ohio.....	325,136	5,167	15.89
Richmond, Va.....	96,660	1,556	16.12
St. Louis, Mo.....	560,000	9,425	16.83
New Port, R.I.....	20,000	349	17.45
London (1894), Eng.....	4,349,166	77,039	17.71
San Francisco, Cal.....	330,000	5,914	17.92
Utica, N. Y.....	50,000	898	17.96
Berlin (1894), Ger.....	1,655,235	30,961	18.10
Cincinnati, Ohio.....	336,000	6,096	18.14
Glasgow (1894), Scot.....	686,820	13,674	19.90
Paris (1894), Fr.....	2,424,705	49,205	20.25
Philadelphia, Pa.....	1,163,864	23,797	20.44
Brooklyn, N.Y.....	1,100,000	22,568	20.51
Ottawa, Ont.....	52,000	1,083	20.82
Providence, R.I.....	145,472	3,087	21.22
Fall River.....	89,303	1,902	21.29
Pittsburg, Pa.....	275,000	5,004	21.83
Lowell, Mass.....	84,359	1,857	22.01
Boston, Mass.....	501,083	11,329	22.60
New York, N.Y.....	1,879,195	43,420	23.10
Vienna (1894), Austria.....	1,465,637	33,944	23.16
Liverpool (1894), Eng.....	507,230	12,073	23.79
Montreal, Que.....	249,000	6,179	24.81
Jersey City, N.J.....	192,713	6,285	34.39

INSPECTIONS RE CONTAGIOUS DISEASES.

Diphtheria	8,866
Scarlet fever	1,521
Typhoid fever	391
Measles	144
Whooping cough	7
Chickenpox	7
Funerals patrolled	37
Houses disinfected	742

INSPECTION OF MEAT.

On no question of social economy is the general public more ignorant than on that of the unwholesomeness or otherwise of the flesh they eat. Many, from the exigency of their positions, are ever looking out for bargains, even in meat. It is not, however, admitted that meat at a low price is always cheap, for poor meat is never cheap. Half the quantity of well fed beef, mutton, lamb or veal will yield more nutriment than the poorly fed, and will in the end prove to be the cheapest.

We have often sympathized with those butchers who will not buy any meat but the best. The general public misjudge them, and sometimes consider the necessary prices extortionate, while in reality the butcher is probably getting little more than cost for a large part of what he sells. It would certainly help the honest man in the trade, and protect the public at large, if the law required all meat to be inspected, branded and graded first, second or third quality. In this way the public themselves would learn what they were buying, and would thus be able to choose for themselves.

The following may be mentioned as some of the characteristics of unwholesomeness in meat:

Beef—When beef has been dressed with blood in it the meat is of a dark mahogany color, the blood showing in clots in the vessels. The tissues are soft, showing blood-stains, decomposition taking place early after

death, the muscle not having its usual amount of firmness, and being somewhat sticky and flabby.

The meat on being cut is dark, and on exposure to the air soon becomes darker. The meat, when partly decomposed, is easily broken down, and speedily becomes tainted, emitting an offensive odor. The muscles in such meat are soft and inelastic. When the meat is cut it is dark and sticky to the touch, showing a general absence of firmness.

Meat which might be classified as third-class is that derived from ill-thriven, badly nourished cattle. It is generally lean and dry, not having the bright, florid appearance of well-fed beef. The muscles may be as firm as those of first-class meat, but the fat will be deficient in amount, and of a tallow-like character.

Veal—Veal prepared from an animal too young to make wholesome food is often marketed. Such meat will be of a leaden-gray color, and watery. The muscles will be soft and flabby, the fat pale and serous, somewhat resembling soaked tallow. The meat, on being cut, will have a spongy appearance.

Experience does not justify the assertion that tuberculous meat is often presented in the markets of the City of Toronto. The extreme debility and wasting incidental to tuberculous disease unfits such cattle for the meat market.

The disease actinomycosis is much more common. It is generally admitted by veterinary authorities that when the disease is circumscribed, and not of a generally infective character, the balance of the carcass will make wholesome meat. This disease is recognized as a form of osteo-sarcoma of the jaw, which is at first local and of limited area, but, after the tissue adjacent to the new formation breaks down to such an extent as to open up blood vessels, general systemic infection occurs, and

lesions of a similar kind may occur in any of the tissues or organs. Actinomycosis is more a danger to the cattle-dealer, owing to the fact that an infected beast may infect others of the same herd. The usual practice in connection with the cattle market here is to slaughter cattle affected with actinomycosis, or lump jaw, and if, on a post-mortem examination, the disease is found to be entirely local the balance of the carcass is allowed to pass.

The inspection of food was transferred to the Medical Health Department on the 1st day of April, 1896. From that date until the 31st day of October, 1896, the following numbers of animals have passed through the market:

Cattle	73,099
Hogs	125,124
Sheep and lambs	70,757
Calves	5,159
Total	274,139

Number of inspections of street shops, butcher shops,
and other places where meat is sold 4,655
Shops and warehouses where fish is sold 501
Shops and warehouses where bread is sold 1,565

The following is a list of confiscated food stuffs made during the above period:

5,103 lbs. of beef.
183 lbs. of mutton.
330 lbs. of veal.
8,894 lbs. of fish.
4½ gallons of oysters.
13 turkeys.
15 pair ducks.
23 pair chickens.
48 baskets of peaches.
14 barrels of apples.
105 baskets of cucumbers.
6 boxes of cucumbers.
108 boxes of strawberries.
3 cases of eggs.
72 rolls of butter.

SHOP INSPECTION.

Since October, 1895, there has been appointed in the Municipality of the City of Toronto a Female Shop Inspector, under the Act for the protection of persons employed in places of business other than factories, and since that date a thorough inspection has been made of all such places within the City of Toronto and coming within the Act.

Four thousand seven hundred and thirty inspections in all have been made, of which 267 were places coming within the Act. Complaints were registered against 39 of such places. With the exception of the large stores in the City many of the places of business are where the persons employed are members of the same family, or where a number of employees are not more than five in number, and therefore do not come within the meaning of the Act. The following is the Act in brief under which such inspection is carried on:

CHAP. 54.] PROTECTION OF EMPLOYEES. [55 VICT.

CHAPTER 54.

An Act for the Protection of Persons Employed in Places of Business other than Factories.

[Assented to 14th April, 1892.]

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:

1. (1) This Act does not apply to any place of business which is within the operation of The Ontario Factories' Act, or The Ontario Factories' Amendment Act, 1889; nor (2) to any place of business where the only persons employed are members of the same family; nor (3) to any place of business where the persons employed are not more than five in number; nor (4) to any place of business where women or girls are not employed.

2. Save as mentioned in the preceding section this Act applies to every place of business whether for the sale or manufacture of goods, or for any other kind of business in which women or girls are employed, and to all rooms and buildings used in connection with or for the purpose of the business.

3. Every building or apartment or place to which this Act applies shall be kept properly ventilated, so as not to be injurious to the persons employed therein, and shall have in connection therewith, or within convenient distance and with convenient access thereto, a sufficient number and description of privies, earth or water closets and urinals for the employees of the business; such closets and urinals shall at all times be kept clean and well ventilated, and separate sets thereof shall be provided for the use of male and female employees, and shall have respectively separate approaches.

4. Every person who, in his own behalf, as owner or partner, or as the manager or agent for the person, firm, company or corporation occupying the premises, has charge of the business and employs persons therein, shall be responsible for every violation of this Act in the same manner as employers under the Factories' Act, Rev. Stat. c. 208.

5. Every Municipal Council to which this Act applies shall appoint inspectors, or authorize persons to act as inspectors, for the enforcement of this Act, and shall make regulations or By-laws respecting their conduct and duties, and for the enforcement of this Act generally.

6. All fines imposed under this Act shall be paid over to the Treasurer of the Municipality to and for the use of the Municipality, notwithstanding anything contained in section 37 of the Factories' Act.

7. Except as aforesaid, sections 32 to 39, inclusive, of The Factories' Act shall apply to this Act, Rev. Stat. c. 208, ss. 32-39, to apply.

SANITARY BRANCH.

Classification of Complaints.

Privy pits foul and full	1,336
Privy pits, new, established without permission	20
Dry-earth closets	77
Foul, damp or wet cellars	203
Unsanitary premises, filthy yards	327
Defective and obstructed plumbing and drainage	457
Garbage, slops, manure, etc., thrown in lot or lane	133
Foul stables (cow or horse)	72
Water on vacant lots	48
Water under houses	44
Foul wells and cisterns	29
Foul sewers	62
Foul culverts	28
Rag shops	12
Miscellaneous	195

A Summary in Detail of the Work done in Sanitary Branch.

Total No. of complaints received in Department	3,355
" " inspections of nuisances complained of ..	7,409
" " notices and letters issued respecting complaints	2,539
" " house to house inspections	4,605
" " inspections of livery stables	67
" " " rag shops	37
" " " slaughter houses	49
" " " milk depots	2,326
" " " cow byres in City	239
" " " cow byres outside City	207
" " " bake shops (prior to the enactment of "The Bake Shops Act")	224

Cases prosecuted in the Police Court for the year ending October 31st, 1896.

For full and foul privy pits	46
" establishing new privy pits	5
" burying contents of privy pits in yards	4
" defective plumbing and drainage	14
" filthy premises	16
" filthy rag shops	4
" foul cellars	3

For foul stables	2	
“ stagnant water on vacant lots	2	
“ keeping cows within prescribed limits	1	
“ selling milk without a permit from M. H. O.	1	
“ feeding raw flesh to hogs	1	
“ breaches of Plumbing By-law	6	
“ “ Ice Regulations	11	
“ “ Quarantine Regulations	2	
No. of cases in Court, Nov. 1st, 1895	8	
“ summonses issued Nov. 1st, '95, to Oct. 31st, '96	67	
“ cases withdrawn (work done)	51	75
“ “ dismissed	2	
“ “ remanded for sentence	3	
“ “ fined	16	
“ “ still in Court (Oct. 31st, '96)	3	
	—	75

Fines were imposed as follows:—

Offence.	No. of Fines.	Amount of Fines.
For keeping cows within prescribed limits	1	\$ 1.00 and costs or 10 days.
“ burying contents of privy pits in yards	1	5.00 without costs.
“ filthy premises	2	10.00 and costs or 10 days.
“ filthy rag shops	2	10.00 “ 14 “
“ breach of ice regulations	8	61.00 “ 14 “
“ breach of plumbing By-law....	2	9.00 “ 14 “
Total amount of fines		\$96.00

ICE REGULATIONS.

1. No person shall cut, harvest, or in any way obtain any ice within or without the limits of the City of Toronto, which is intended either for domestic use or for cooling purposes within the said limits, or shall sell, store or distribute within the said limits any such ice, without having first obtained a permit therefor from the Medical Health Officer of the said City, for which a fee of one dollar shall be paid.

2. No ice shall be sold, delivered or stored within the City of Toronto for domestic use or for cooling purposes (except as hereinafter specially provided) which shall be produced by the freezing of water which, on analysis, shall be shown to be other

than that of absolute chemical purity, and upon bacteriological examination shall show more than 80 colonies of bacteria per cubic centimeter.

3. All ice cut, harvested or intended for cooling purposes only, shall be housed forthwith after being cut, and when the icehouse to which said ice is consigned shall be filled, or shall, in the opinion of the Medical Health Officer, have received its consignment for the season, the said house shall be closed and sealed by the Medical Health Officer or the Sanitary Inspector, and it shall not be opened, nor any ice removed therefrom, save and except with the consent in writing of the said Medical Health Officer.

4. No permit shall be granted in pursuance of these regulations to cut, harvest, sell, store, deliver or obtain ice for domestic use or for cooling purposes (except in cases provided for in section 5 of these regulations) from any portion of the Toronto Bay, Ashbridge's Bay, the River Don, the Humber, or in or from any pond, bay, or body of water which has not first been approved of by the Medical Health Officer.

5. The said Medical Health Officer may grant permission for ice to be cut and stored for cooling purposes only from the Toronto Bay, and other water in such places and parts as he may select, the said ice to be cut and harvested under the direction of the said Medical Health Officer, and to be housed and stored in houses to be approved of by said Medical Health Officer, the said houses, immediately after receiving such ice, to be closed and sealed by said Medical Health Officer, and to be opened only with his permission and under his inspection.

6. The Medical Health Officer may grant permission for ice to be delivered for cooling purposes to tradesmen and others, excepting milk-dealers, dairymen, hotel and restaurant keepers, who have safes or receptacles for the storing of the same, which have been approved by the Medical Health Officer, or a Sanitary Inspector of this Board, and who do not retail or sell ice; provided that any dealer in ice supplying ice to such party or parties for such purposes, shall, before beginning to deliver the same, inform the said Medical Health Officer of the names, addresses and occupations of all parties to whom such dealer is desirous of delivering such ice.

7. All ice to be delivered for cooling purposes shall be carried for delivery in waggons to be approved of by said Medical Health Officer, and which shall be used for no other purpose.

8. All dealers supplying ice to such persons shall, on delivering the same, place and store said ice in the receptacles or safes approved as aforesaid by the said Medical Health Officer or Sanitary Inspector, and shall immediately thereafter secure and seal the same, and the said receptacles or safes shall not, without the consent in writing of the said Medical Health Officer, be opened except by the dealer or dealers supplying the said ice when making their next delivery.

9. All dealers in such ice, before obtaining a permit to deliver ice for cooling purposes, shall enter into good and sufficient bonds, to the satisfaction of the said Medical Health Officer, that no such ice shall be delivered to any person or persons than those named and approved by the said Medical Health Officer, and that these regulations shall be faithfully observed and performed.

10. No person shall store in the same building, ice which has been cut or harvested for cooling purposes only, with ice intended for domestic use.

11. Any ice obtained from a source not approved of by the said Medical Health Officer, and stored or used, or intended to be stored or used, within the limits of the said City of Toronto, shall be liable to seizure and confiscation by the Medical Health Officer or by any Sanitary Inspector.

12. Any person convicted of a breach of any of the provisions of these regulations shall forfeit and pay, at the discretion of the convicting Magistrate, a penalty of not less than five dollars, and not exceeding the sum of twenty dollars for each offence, and in default of payment of the said penalty and costs forthwith, the said penalty and costs, or costs only, may be levied by distress and sale of goods and chattels of offender, and in case of there being no distress found out of which such penalty can be levied, the convicting Magistrate may commit the offender to the common jail of the City of Toronto, with or without hard labor, for any period not exceeding one calendar month, unless the said penalty and costs be sooner paid.

Before any ice is drawn from the locality mentioned in the permit, a ticket is to be given to the driver by the Medical Health Inspector for the delivery of the same, and the counter check is to be returned by the driver after such delivery.

AMBULANCE REPORT.

Toronto, November, 1896.

Chas. Sheard, Esq., M.D., Medical Health Officer :

Total number of calls received from Nov. 1st, 1895, to Oct. 31st, 1896	623
Removed to General Hospital—	
Typhoid fever	125
Bronchitis	2
Blood poisoning	4
Tonsillitis	2
Chickenpox	8
Measles	23
Rheumatism	1
Gangrene	1
Mumps	7
Erysipelas	14
	187
Removed to St. Michael's Hospital—	
Typhoid fever	32
Erysipelas	1
Inflammation of throat	1
	36
Removed to Grace Hospital—	
Typhoid fever	25
Diarrhœa	1
	26
Removed to Victoria Hospital for Sick Children—	
Typhoid fever	16
Pneumonia	1
	17
Removed to Western Hospital—	
Typhoid fever	1
Removed to Isolation Hospital—	
Diphtheria	292
Scarlet fever	42
Measles	11
	345
Number calls where Ambulance not required	13
Total amount collected	\$81

Your obedient servant,

F. HAGUE.

REPORT OF MEDICAL SUPERINTENDENT OF ISOLATION HOSPITAL.

ISOLATION HOSPITAL,
November 23rd, 1896

Charles Sheard, Esq., M.D., Medical Health Officer, Toronto :

Sir,—I have the honor to submit the following report regarding the Isolation Hospital for the year ending November 22nd, 1896.

1. There were admitted to the Hospital during the year 451 patients of all kinds, 388 cases of diphtheria, 55 cases of scarlet fever, and 8 cases of measles. On November 23rd, 1895, when the hospital year commenced, 48 patients were in the Hospital, and to the end of the month 16 were added to the number. In December 46 were admitted; in January, 1896, 54 were admitted; in February 26, in March 23, in April 29, in May 23, in June 30, in July 25, in August 11, in September 15, in October 44, and to November 22nd inclusive, the end of the year, 51 were admitted.

Of the 451 patients, 363 were discharged from the Hospital in the regular manner, 52 died, and 48 remained in the Hospital when the year closed.

2. *Diphtheria.* The admissions for diphtheria during the year numbered 388. All of them were subjected to a bacteriological examination. Whenever a patient was brought to the Hospital, a swab or smear was at once taken and forwarded to the efficiently equipped Laboratory of the City Medical Health Department, where Professor Shuttleworth, who has charge of the City's bacteriological work, made an exhaustive examination of each case. In this way it was discovered that 36 of our cases of supposed diphtheria were not cases of that disease, and that instead of 388 cases, we had 352 cases during the year of true diphtheria in the Hospital.

Of these 352 cases, 175 were tonsillar, 50 tonsillar-pharyngeal, 3 pharyngeal, 81 naso-pharyngeal, 32 laryngeal, and 11 laryngo-naso-pharyngeal. The laryngo-naso-pharyngeal proved a very dangerous and fatal form of the disease, death occurring in 7 of the 11 cases. Since the introduction, a few years since, of a more systematic and energetic employment of steaming, and of calomel sublimation, in the treatment of laryngeal diphtheria, a remarkable diminution has taken place in the mortality of what a few years ago was the most fatal of all the forms of this terrible disease. We had 32 cases of purely laryngeal diphtheria

during the year, and of these only 9 died, and of the 9 all but one were moribund when admitted. During the year there were in all 14 moribund cases, 8 of them were laryngeal, 5 naso-pharyngeal and 1 laryngo-naso-pharyngeal.

There were 52 deaths. If we include the moribund cases, the death rate was 14% per cent., and if we exclude them it was 11% per cent.

3. *Scarlet Fever*. There were admitted during the year 55 cases of scarlet fever. Thirty-nine cases were S. Simplex, 14 of S. Anginosa, and 2 of S. Maligna. There were no deaths.

4. *Measles*. There were 8 cases of measles and no deaths.

Your obedient servant,

G. TWEEDIE, M.D.

REPORTS MADE TO THE MEDICAL HEALTH OFFICER
ON
Work done in the Bacteriological Laboratory
BY
E. B. SHUTTLEWORTH, PHAR.D., F.C.S.

REPORT ON WATER TAKEN FROM THE LABORATORY TAP.

OCTOBER 31st, 1896.

CHARLES SHEARD, Esq., M.D.,

Medical Health Officer, Toronto :

Sir,—The periodical examinations of laboratory tap water have been continued, at about weekly intervals, or more frequently if demanded by circumstances, during the past official year. The results are herewith appended. The figures refer to colonies of bacteria per cubic centimetre:

1895.		1896.	
Nov. 2.....	200 cols.	April 6.....	9,870 cols.
" 4.....	1,936 "	" 10.....	19,270 "
" 6.....	360 "	" 13.....	8,530 "
" 10.....	400 "	" 20.....	2,240 "
" 16.....	1,850 "	" 27.....	2,435 "
" 25.....	1,115 "	May 5.....	1,240 "
Dec. 2.....	2,250 "	" 11.....	690 "
" 9.....	3,620 "	" 18.....	375 "
" 16.....	440 "	" 26.....	300 "
" 23.....	300 "	June 2.....	275 "
" 26.....	1,160 "	" 12.....	230 "
" 30.....	2,960 "	" 18.....	220 "
1896.		" 25.....	280 "
Jan. 6.....	435 "	July 2.....	299 "
" 13.....	4,465 "	" 9.....	300 "
" 20.....	1,430 "	" 17.....	380 "
" 27.....	520 "	" 23.....	470 "
Feb. 3.....	1,410 "	" 30.....	195 "
" 10.....	1,160 "	Aug. 6.....	305 "
" 17.....	11,525 "	" 13.....	470 "
" 24.....	1,311 "	" 20.....	325 "
Mar. 2.....	3,020 "	" 27.....	340 "
" 9.....	 "	Sept. 3.....	185 "
" 16.....	899 "	" 10.....	270 "
" 23.....	8,255 "	" 19.....	333 "
" 30.....	2,910 "	" 29.....	380 "
		Oct. 14.....	450 "
		" 20.....	505 "
		" 27.....	270 "

Monthly Averages.

	1895-6.	1894-5.	1893-4.
November	977	1,840	420
December.....	1,788	5,255	2,050
January	1,717	2,036	5,235
February	3,851	785	7,196
March	5,058	5,852	5,172
April	8,469	8,983	2,353
May.....	651	422	1,172
June	251	495	270
July.....	329	543	236
August	360	326	206
September	292	1,758	310
October	406	1,360	342
Averages per month.....	2,012	2,470	2,080

Averages by Seasons.

	1895-6.	1894-5.	1893-4.
October, November, December.	1,402	2,477	996
January, February, March.....	3,542	2,897	5,867
April, May, June.....	3,123	3,300	1,265
July, August, September.....	327	633	250

The influence of the accident to the conduit, which occurred on September 5th, 1895, is apparent in the October returns, as the water during that month was largely drawn from Block-House Bay. This affects the figures for 1896, and shows the water supply, for the first quarter, to be worse than it would otherwise have been. Notwithstanding this, a comparison of the quality of last year's supply with that of 1894-5 exhibits the former in the more favorable light, and when the whole statistics of the past three terms are compared, as in the above "Averages per Month," the year just concluded is shown to be much better than that which preceded it, and an improvement on any during which observations have been taken.

Increase of Bacteria in Winter.

The recurrence of high figures, during the winter months, is again evident. Allusion has been made to this in previous reports, and the causes indicated, namely: the influence of stormy weather, and the annual inversion of the cold and warm strata, with consequent vertical currents. To this may be

added the occurrence of an organism which I am convinced does not develop in summer, but rapidly increases in the cold season.

This organism makes its appearance in autumn. In 1895 it was first noticed on November 16th, and, this year, a few were discovered on October 20th. The number increases as the season advances, and at times the bacilli may amount to 75 per cent. of the total organisms. Thus, on December 2nd, 1895, there were 1,750 out of 2,250 colonies, equal to 77 per cent. The presence of this organism has consequently much to do with the high figures of winter, but does not necessarily indicate a dangerous impurity. I have cultivated the bacillus in bouillon, and injected it into the peritoneal cavities of guinea pigs, without harmful effect, thus proving its non-pathogenic character.

The cultural and microscopical characters of the bacillus most nearly conform to those of *Bacillus Ochraceus* first isolated by Fazio, and described by Zimmerman in *Die Bakterien unserer Trink- und Nutzwasser, insbesondere des Wassers der Chemnitzer Wasserleitung*, 1890. I believe the Toronto organism to be identical with that found in the Chemnitz supply.

The Lake Level.

The quality of the water supply is, to some extent, affected by the lake level, for if the actual amount of organic matter present be taken as a more or less constant quantity, its relative proportions will differ with the degree of dilution. The range between the extremes of high and low water has been known to amount to as much as six feet, or one-twelfth of the total depth at the intake; or one-fiftieth of the average depth of the lake. It is reasonable to conclude that the supply is proportionately purer at times of high water, and correspondingly affected when the water is low.

The year 1895 was one of exceedingly low water, both in regard to the extreme winter level and the high water of spring. The maximum was reached on May 18th, when the Harbor Master's gauge registered one inch below zero, from which point the water fell to twenty-five inches below zero on November 28th. Both figures are without parallel during the forty-one years of which authentic records have been kept.

From November last the level raised so that at the close of December the water stood at 19 inches below zero. During January there was an increase of $1\frac{1}{2}$ inches, and a similar rise in February. The thaws and rains of March raised the lake

about $6\frac{1}{2}$ inches, and the spring freshets, during April, occasioned a further increase of 13 inches, bringing the level to its highest point for the year, 3 inches above zero.

During May and June the variation in level was within the limit of 2 inches, and, by the close of July, the total fall was $5\frac{1}{2}$ inches, which, through August, was increased to $8\frac{1}{2}$ inches. A rapid drop of 4 inches occurred during September, followed by $4\frac{1}{2}$ inches in October, leaving the level, on October 27th, at 14 inches below zero by the Harbor Master's gauge, and $10\frac{1}{2}$ inches by that of the Water Works Department.

It seems more than probable that, while 1895 marked the lowest water observed, the present year will, in this respect, occupy the second place, a position which would otherwise have to be assigned to 1872, when the maximum and minimum were, respectively, $3\frac{1}{4}$ inches above and $16\frac{1}{4}$ inches below zero.

Many causes have been assigned for the fluctuations of Lake Ontario. The question is one of considerable difficulty, mainly on account of insufficiency of data, and it appears to be impossible to formulate, with any degree of certainty, a method by which the future may be predicted. The generally received opinion that high water recurs at a given interval of years is not at all borne out by an analysis of records, and the supposition that the present low level is due to the removal of obstructions in the St. Lawrence is equally untenable, as these impediments have not been taken from a point where they would have this effect. Neither can the Chicago Drainage Canal, now under construction, have any influence, as that work is not yet in operation.

The principal conditions which influence the level seem to be (1) the rainfall over the entire watershed of the chain of lakes; (2) the height of the level of each lake with reference to that above it; (3) the evaporation from the surface, as governed by the temperature and humidity of the air. Mr. Kivas Tully and Mr. R. F. Stupart, have lately thrown much light on this subject; but until more complete data are obtainable, through the establishment of meteorological stations at the principal lake ports and over the watersheds, any practical conclusion is impossible. It may, however, be said that the present relatively high level of Lake Superior indicates a future rise in Lake Ontario, especially if the local snow and rainfall during the winter should come up to the average.

Temperature of the Tap Water.

Observations have been continued on the temperature of the laboratory tap water on every occasion on which a sample was taken for analysis. The intervals were generally weekly, but the results may be most intelligibly given in monthly averages. The degrees are centigrade. The figures for last year are, for purposes of comparison, placed in parallel columns. The averages for September and October, 1895, are omitted, as they relate to the period of the accident to the conduit, and would thus be misleading.

	1895	1894		1896	1895
November	5.9	6.9	May	6.7	6.1
December	3.4	4.4	June	9.0	6.7
	1896	1895			
January	2.3	2.3	July	8.8	9.1
February	1.7	2.5	August	3.9	9.0
March	1.7	2.5	September	10.9	
April	3.3	3.0	October	8.5	

On September 19th the temperature of the tap water rose to 15 degrees C., equal to 59 degrees F. This occasioned some alarm to water consumers, but, as pointed out in a report then submitted, and hereto attached, this high temperature is not unusual for the season, and was of no special significance. I do not think this will occur when the wooden pipe in the lake is replaced.

Anticipated Influence of the New Lake Conduit.

I am more than ever convinced that the completion of the lake section of the new steel conduit now under construction, between the Island and the Bell Buoy, will make a great improvement in the character of the water supply. The old wooden conduit now in use has, in my opinion, been in a leaky condition for some years at least. In December, 1892, when I made my first examination of the pipe line, I reported that there was a leak somewhere between the Intake and Hanlan's Crib. Opportunity was not then afforded to determine whether this imperfection was located in the section of pipe between Hanlan's Crib and the Connecting Crib, on the shore of the Island, or between the latter station and the Bell Buoy. I have since, on many occasions, tested the water at these points, and have had no difficulty in pronouncing definitely on the bad condition of the lake section. This was frequently pointed out in the reports,

and subsequent investigation by the Engineer's Department proved the truth of the conclusion.

Although this section was repaired as far as possible, defects still exist, and there can be no doubt that the City supply more nearly conforms to the water at the Bell Buoy than that of the Intake, and is, in reality, a mixture of the water from both sources. In anticipation of the completion of the work now in progress, I venture to repeat the statement that a marked improvement may be looked for, to which the incident expense is an inconsiderable item.

I have the honor to be, sir,
Your obedient servant,
E. B. SHUTTLEWORTH.

LABORATORY,

Toronto, Sept. 19th, 1896.

Dr. Charles Sheard, Medical Health Officer, Toronto:

Sir,—I have made an investigation into the circumstances which are alleged to have given rise to a newspaper rumor of disturbance of the conduit, and find the case to be as follows:

On Wednesday last, September 16th, the temperature of the water delivered to the City was 64 degrees F., as claimed in the newspaper report alluded to, but this high temperature is not necessarily an indication of accident to the conduit. An examination of the records during past years show that temperature as high as this, or even higher, have been registered, under normal conditions. The following table exhibits this:

	1896. Temp.	1895. Temp.	1894. Temp.
August 6th.....	8.0	7.5	•10.5
“ 13th.....	9.3	13.0	14.2
“ 20th.....	6.6	12.5	16.3
“ 27th.....	11.7	7.5	17.6
September 3rd.....	7.2	7.7	16.7
“ 10th.....	12.5	10.5	16.2
“ 19th.....	15.0	....	13.0
“ 24th.....	....	....	8.0

The above shows that in 1894 the temperature gradually rose to 17.6 (64 F.), and then decreased, the conduit remaining intact. Similar circumstances this year indicate a similar conclusion.

In order to ascertain whether there was any marked difference in the temperature of the water at various points along the conduit, I obtained the following figures:

Date.	Shore Crib.	Island Basin.	Hanlan's Crib.	Pumping W.
September 13th, 1896	64	62	62	60
" 14th, "	63	63	63	62
" 15th, "	63	63	63	64
" 16th, "	64	64	64	64
" 17th, "	61	64	62	64
" 18th, "	62	65	60	62
" 19th, "	57	58	..	59

It is here shown that on the 15th and 16th the temperatures at all the stations were quite uniform, from which it may be concluded with some degree of certainty that there was not any admixture of foreign water of a temperature different from that of the Lake.

The last analysis, which was made on September 10th, shows the water to be of a good quality, and I have to-day commenced another examination. The result of this will show conclusively the existing condition, but, from temperature observations, as herewith submitted, I can see no reason to conclude that anything extraordinary has occurred.

REPORT ON THE CONDITION OF THE CONDUIT.

Charles Sheard, Esq., M.D., Medical Health Officer, Toronto:

Sir,—In accordance with your directions, and in furtherance of a suggestion of the City Engineer, I herewith submit a report on the character of the water supply, as shown by the examination of samples taken from various points along the Conduit.

These samples were obtained on October 2nd, after a severe south-easterly storm, which commenced on September 29th, and continued through the succeeding day, the velocity of the wind sometimes reaching 42 miles per hour. The rainfall equalled 2.13 inches. At the time of my visit there was still a swell from the south-east, with a light breeze from that direction. The line of muddy water extended far into the lake, more especially at the eastern and western extremities of the Island.

In the vicinity of the Intake it did not reach so far, but was very evident for several hundred feet beyond that point. The conditions were therefore decidedly unfavorable, and calculated to exhibit the water in its worst state, rather than that which usually prevails.

The first sample was taken in line with the Intake, but about three miles distant from the shore, a second sample being obtained at a distance of about one mile from shore, and still outside the influence of land contamination. The third sample was taken from the muddy water at the Intake, and the others at the various points along the line, covering, in all, a distance of about seven miles, terminating at the laboratory tap.

The stations and results of the bacteriological examination of the samples are as follows. In order to facilitate comparisons, I have appended the results of a similar examination made on October 26th last year.

	Oct. 2, 1896. Cols. per c.c.	Oct. 26, 1895. Cols. per c.c.
Station 1—Pipe line produced 3 miles from shore; depth, over 200 feet; sample taken at 55 feet; temperature, 49 F...	40	....
Station 2—Pipe line produced 1 mile from shore; sample taken at 55 feet	45	....
Station 3—Intake; depth, 79 feet; sample taken at 55 feet.....	240	145
Station 4—Bell buoy; depth, 29 feet; sample taken at 24 feet.....	310	140
Station 5—Shore crib	315	260
Station 6—Settling basin	265	195
Station 7—Hanlan's crib	245	225
Station 8—Pumping well	175	235
Station 9—Laboratory tap	640	386

In order to determine the character of the water of the Bay, I took a sample a little east of the pipe line, and at a point located in the current which exists between the western entrance of the Harbor and the Eastern Gap. The examination revealed the presence of 9,125 colonies per cc. The water was, of course, flowing out of the western channel, and would thus necessarily be much purer than if the direction had been reversed.

The conclusions to be formed from the data submitted are as follows:

1st. That the Lake water, uncontaminated by shore influences, is remarkable for its purity. This is confirmed by many observations made during the past four years.

2nd. That on this occasion the disturbance caused by the recent stormy weather did not increase, to an extent as great as might have been anticipated, the number of organisms in the water, its turbidity being evidently caused by the presence of fine particles of inorganic matter, such as sand and clay.

3rd. That between the Intake and the Shore Crib there is some leak or leaks in the old wooden pipe, thus admitting the shore water to the City supply. This has been previously pointed out on many occasions, and will be remedied by the laying of the new steel pipe.

4th. That the Conduit is not leaking between the Shore Crib and the Settling Basin.

5th. That the Settling Basin operates as a purifying agent.

6th. That the Conduit is tight between the Settling Basin and Hanlan's Crib, and apparently so across the Bay to the Pumping Well.

7th. That the main and pipes between the Pumping Well and the Laboratory tap are in a dirty condition, probably the result of the recent storm.

8th. That the Conduit is in as satisfactory condition as it has been during the four years that I have made any observations in connection therewith.

I may say that when at the Settling Basin I made an inspection of its condition and surroundings, and found everything to be in excellent order, and nothing to which exception could be taken. Fears as to the lateral filtration of Bay or marsh water are groundless. During the construction of the Basin I had many opportunities for observation, and found that even when the bottom of the Basin was 11 feet below the water outside, the infiltration was comparatively insignificant. The difference in head is now not very great, and, even should the outside water permeate the sand, there would be no danger of the passing of bacteria. Filtration through five feet of sand has proved a sufficient protection, and the sand walls of the basin are many times this thickness.

The practical suggestions from the enquiry are: the blowing out of the mains, and the substitution of the old wooden pipe by that now under construction.

I have the honor to be, Sir,

Your obedient servant,

E. B. SHUTTLEWORTH.

REPORTS ON ICE LOCALITIES.

Small's Pond.

Sir,—I beg to report that on September 23rd I visited Small's Pond, for the purpose of taking samples for bacteriological examination. The wind was from the north-west, and quite strong, thus rendering the water somewhat turbid. The following is a list of the localities, and the number of colonies of bacteria per cubic centimetre:

Station 1. East Fork	840 cols.
Station 2. West Fork	815 "
Station 3. North part of main pond.....	880 "
Station 4. Outfall at south end of pond....	435 "
Average	742 "

I inspected the surroundings of the pond, and could not find any evidence of sewage passing into the water, nor did I see anything objectionable in this respect. The ponds contain a considerable vegetable growth, and the odor and taste of the water is decidedly weedy. The turbidity of the water was doubtless due to the strong wind then prevailing, and this disturbance would also have the effect of increasing the number of bacteria. The effect of sedimentation in the deeper and southerly part of the pond was very evident, and I think that under ordinary conditions this portion would afford a field for cutting domestic ice.

I have the honor to be, Sir,

Your obedient servant,

E. B. SHUTTLEWORTH.

Ashbridge's Bay.

Sir,—I beg to present the following report on the bacteriological condition of the water of Ashbridge's Bay, as shown by samples collected on November 16th:

I visited the various points by means of a small boat, proceeding from Sherbourne Street through the canal, and to the eastern extremity of the Bay, and on the return taking in most of the old stations. There was a fresh breeze from the south-west, which occasioned a strong outflow of water from Toronto Bay through the canal, and this by noon had passed beyond Lake Street. The direction and extent of this current was at once shown by the altered color of the water. I made three estimates of the force of the current at different points in the canal. The average of these showed a rate of 50 feet per minute.

The level of the water in Toronto Bay, as recorded by the Harbor Master's gauge, was 22½ inches below zero.

The lowering of the water level has, of course, much modified the outline of the land in Ashbridge's Bay, and has to a corresponding degree affected the depth of the water. The eastern part of the Bay, formerly known as Brown's Pond, and extending about 2,000 feet west of Carlaw Avenue, is now a bank of soft mud, which is elevated a few inches above the surface of the water. This mudbank stretches southerly to the sandbar at the Lake, and has an area of about 170 acres. That part of the Bay in line with Leslie Street, and near the sandbar, where ice for cooling purposes was cut last year, is now too shallow for this purpose, as the water is only from 2 to 3 feet in depth.

The stations from which the samples were taken are as follows:

Station 1. Middle of channel, and outside west pier in lake, depth 4 feet, sample 3 feet	8,665	cols.
Station 2. In line with Coleman's house and lake channel, middle of Bay (875 feet from shore), depth 4 feet, sample 3 feet	131	"
Station 3. South of Coleman's icehouse, and middle of Bay, depth 4 feet 9 inches, sample 3 feet....	4,255	"
Station 4. South of Lake Street, and middle of Bay (1,375 feet from shore), depth 4 feet 9 inches, sample 3 feet	273,720	"
Station 5. South of Leslie Street, and middle of Bay (1,250 feet from shore), depth 2 feet 10 inches, sample 1 foot 6 inches	410,580	"
Station 6. Middle of canal, west of Leslie Street sewer, depth 5 feet 6 inches, sample 4 feet	456,327	"
Station 7. Middle of canal, west of Morse Street sewer, depth 8 feet, sample 4 feet	155,640	"
Station 8. Middle of canal, west end of piling, depth 7 feet, sample 4 feet	408,525	"
Station 9. Middle of channel at breakwater, Toronto Bay, sample 4 feet	445,360	"
Station 10. South of Methodist Church, Leslieville, and 300 feet from sandbar, depth 4 feet 9 inches, sample 3 feet	4,395	"
Station 11. Toronto Bay, south of Evan's boathouse, foot of Sherbourne Street, depth 3 feet, sample 2 feet	261,785	"
Station 12. Laboratory tap		

This examination demonstrates very clearly the effect of westerly winds on the water of Ashbridge's Bay. The water of Toronto Bay is thereby forced in through the canal, and is distributed in this way to parts in line with the current. The portion east of Leslie Street, and near the sandbar, is only contaminated to a moderate extent, while the eastern end of the Bay, beyond the new channel, apparently escapes altogether. This part is, however, of limited area and depth.

It is likely that under easterly winds the condition would be entirely reversed, clear water passing in by the new channel, and making its escape through the canal, and thus into Toronto Bay.

As a result of this investigation, I am of opinion that Ashbridge's Bay cannot be accepted as a source for domestic ice, but that ice for cooling purposes might be taken from certain localities, namely, east of a line drawn from Coleman's Icehouse southerly to the sandbar; and in the area enclosed by the following boundaries: On the east by the west boundary of the new channel, thence southwesterly along the sandbar to a point due south of the Leslieville Methodist Church, thence 500 feet northerly on said line, and thence easterly to the place of beginning.

I have the honor to be, Sir,

Your obedient servant,

E. B. SHUTTLEWORTH.

BACTERIAL DIAGNOSIS OF DIPHTHERIA.

Sir,—I beg to submit the following statement of the bacteriological work carried on in connection with the diagnosis of diphtheria, as applied to the admission and discharge of patients in the Isolation Hospital, and also to cases referred to the Department by City physicians.

In your last Annual Report you published the results of this branch of bacteriological work from the time of its inception, on February 1st, 1895, until June 30th following. A detailed account of the operations continued from the last named date to July 1st, 1896, was presented at the Annual Meeting of the Executive Health Officers of Ontario in September last. As it is impossible to report immediately on cases of which the clinical results may not be known for two months, or perhaps longer, from the time of the first bacteriological examination, I therefore submit the paper referred to as part of this report, and suggest that the practice thus necessitated be a precedent for the future.

REPORT.

A year ago I had the pleasure of presenting the results of six months' bacteriological work in connection with diphtheria, as carried on in the laboratory of the Toronto Board of Health. I now desire to briefly continue the record, so as to cover the intervening period from July 1st, 1895, to June 30th, 1896, and also to offer such deductions as seem justified by prolonged experience.

There were examined during this period the original exudates from 559 patients, of which 377 were from the Isolation Hospital, and 182 from City physicians. The clinical records of the former cases are complete, but no systematic attempt was made to keep track of the latter, and the details submitted only refer to bacteriological particulars.

Collection of Exudates. The plan first pursued in this laboratory of supplying swabs in corked tubes, and making the cultures in the laboratory, has proved, in all respects, entirely satisfactory. Published records of other institutions show that when both swabs and media are supplied, a considerable portion of the cultures are unsatisfactory, and have to be so reported. This arises partly from the fact that the culture media is dried up, or from the removal of the wool has become contaminated, and, partly, that physicians are not, perhaps, all as careful, or capable, as the laboratory worker, who is constantly engaged in such manipulations. There is abundant evidence to show that it is best for the bacteriologist to sow the seed as well as to look after the crop. Under such conditions, and with good swabs, there need not be any failures whatever.

Too much emphasis cannot be placed on the latter point. The physicians should endeavour to wipe off a small piece of membrane, or at least to use sufficient force to detach some of the outside layer, which is commonly richest in bacilli. The presence of epithelial cells, as shown by the microscope, is pleasing evidence that some force has probably been used, and that the exudate submitted is not mere superficial mucus.

Diagnosis by the Exudate. I am more than ever convinced of the advisability of examining the exudate before making a culture. Reliable conclusions may often be arrived at in a few minutes. The gain of twenty-four hours in making a sure diagnosis is worth much to the physician; more to the patient; and often still more in the matter of isolation.

It was previously reported that a certain diagnosis had in this way been made in at least one-third of the cases, and a fair-

ly correct idea in about three-quarters of the exudates examined up to July, 1895. Experience has increased the proportion in which the characteristic bacilli have been thus detected, as I find that positive evidence was given in 54 per cent. of the exudates sent in since that time, while 20 per cent. were marked suspicious, and 26 per cent. negative. Failure to find the bacilli does not prove their absence, and it is only when they possess definite and well-marked characters that the indications are of value. To a fairly experienced eye this appears to be the case in about half the exudates submitted.

Staining. I am not aware of any stain which, for all-round purposes, is better than Loeffler's methylene blue. Having tried many others, including the dahlia and methyl green mixture of Roux, one returns with pleasure and satisfaction to the old and well-tried formula.

Fifty-six experiments were made with most of the eligible anilines, with various additions, but though many combinations answered well—as the bacillus is easily stained—none gave better septation and polarity than that of Loeffler, while for ease in working, uniformity of effect, and keeping qualities, the latter proved superior.

Relation between the Size of the Bacillus and its Virulence. Observations as to the size of bacilli found in cultures have been continued during the year, and the results confirm the statement previously made—that this character affords little on which to base a prognosis. The records show that the disease was mild or severe in about an equal proportion of the cases in which the cultures showed large bacilli. Mild cases predominated when the bacilli were of medium size, and this was also the case when the micro-organisms were small. In the instances in which the bacilli were very irregular the severe cases were nearly double those which were classed as mild.

On looking up the details of the last 45 fatal cases, there were twenty instances in which the bacilli were large, six medium, ten small, and nine very irregular as to size. Large bacilli here apparently indicate the most serious consequences but I doubt if this and similar data warrant such conclusion, more especially when taken with previous experience, by which an opposite result was reached by Park and Beebe, and also by me. It appears reasonable that long, well-developed bacilli would be likely to grow most vigorously, produce the greatest mechanical obstruction, and the maximum quantity of toxin; but against this there must be taken into account the influence of culture

media and conditions on the development of the bacilli. Parallel cultures of the material from the same swab, if grown under precisely similar conditions, but on serum media of different ages, dryness, or composition, will give organisms which are markedly different in size and type. This has been repeatedly observed, as also the effect of varying incubation temperatures.

The various factors which constitute the resistance of the patient exercise an all-powerful influence on the result of the attack. Taking this, with the circumstances just alluded to, I think it unwise to base a prognosis on such a variable character as size, though with the same medium and conditions the numerical chance seems to favor the idea that the largest bacilli are the most virulent.

The Pseudo Bacillus. The position of the so-called pseudo bacillus has not been any more clearly defined than it was a year ago. It is still maintained by some that an organism exists which, in morphological characters and staining peculiarities, is undistinguishable from the true bacillus; but that, as tested on guinea pigs or rabbits, it is devoid of virulence. Objection may be taken to this test, as pointed out by Lennox Brown in his recently published work on diphtheria. It is argued that these animals may, like horses, possess varying resistance to the toxin, and it is probable that such animals are sometimes altogether immune, as some human beings undoubtedly are. The test of virulence must therefore be made subject to this condition.

I do not purpose entering into this argument, nor is it necessary in practical diagnosis to attempt any nice distinctions. Patients sent to a diphtheria hospital manifest symptoms sufficiently marked to justify their temporary admission, and bear evidence of the attack of organisms possessing some degree of virulence. For hospital purposes it is therefore proper to characterize as diphtheria all cases in which a bacillus exhibiting the peculiarities of that of Klebs Loeffler is found in the exudates or revealed by cultures.

Persistence of the Bacilli in the Throats of Patients. Discharge from the Hospital has for the past year been entirely governed by the results of bacteriological examinations of cultures from the throats of patients. It was formerly the practice to detain patients for 14 days after the disappearance of the membrane, or say 28 days from admission; but it has been proved that this is by no means a safe rule, as many would thus carry infection,

while others would be kept in hospital much longer than necessary.

The shortest time for the disappearance of the bacilli was 14 days, but this may be regarded as exceptional, as the average duration of the term was 22.8 days. In 13.9 per cent. the detention was from 28 to 35 days; 5.9 per cent. between 35 and 42 days; 2.1 per cent. between 42 and 49 days, while in one instance the infection was retained until the 65th day, and another until the 75th day. The case of the second longest term is particularly interesting from the fact that it was one in which antitoxin was employed during the early stage of the disease. The case in which the infection was retained for 75 days shows a longer duration than any cited by Park and Beebe in last year's New York statistics. Longer periods have been recorded elsewhere, as that instanced by Lennox Browne, in which 146 days elapsed after the disappearance of the membrane.

The direct economic advantages of bacteriological examination as a guide to hospital discharge will be evident from the statistics given, and it will only be necessary to indicate the still greater gain which follows the isolation of infected patients, who would otherwise go forth and sow broadcast seeds of future disease.

Pathogenic Organisms Found. In the following table organisms other than the diphtheria bacillus are widely classed as streptococci and staphylococci, but it must not be inferred that the former always indicates *Streptococcus Pyogenes*, or the latter the pus staphylococci. Tetracocci are not included. The classification was made on the microscopical characters of composite serum cultures after an incubation of 24 hours, except the tubes set on Saturday, which were allowed to remain in the thermostat till Monday. Comparisons of the results of cultures of short and long exposures do not lead to the conclusion that 24 hours was not sufficient for the development of the bacteria present.

The table covers both hospital and outside patients, 559 in all. For greater intelligibility the results are given in nearly whole percentages:

	Hospital Cases.	Private Cases.
B. Diphtheriae.....	56 per cent.	40 per cent.
" and streptococci.....	16 "	12 "
" and staphylococci.....	7 "	2 "
" with strepto. and staphylo.	8 "	1 "
Streptococci only.....	2 "	26 "
Staphylococci only.....	6 "	2 "
Strepto. and staphylo.....	5 "	11 "
Other organisms.....	0 "	3 "
Sterile.....	0 "	1 "

Comparison of this table with a similar one submitted last year shows a greater prevalence of cases of pure diphtheria and less of the complex, or cocco-bacillary form, and also a less proportion of coccal, or non-bacillary affections. With regard to the hospital cases, this may be in part accounted for by the fact that physicians have become more careful in the selection of patients. After the first two months following the institution of bacteriological diagnosis the proportion of non-diphtheritic patients admitted was 27.9 per cent.; after six months this had dropped to 24.5; in nine months it was 21.6, and the average for last year was only 12.4 per cent.

Of the city cases the proportion is but slightly changed. The specific bacillus was present in 56 per cent. of the cultures, against 61.7 last year; the cases of non-bacillary infection being 43.4 against 36.3 per cent.

The above facts do not wholly account for the comparative absence of coccus forms, as I have noticed, with regard to *St. pyogenes aureus*—easily recognized in old cultures—that it is at times relatively prevalent, and then for months it seems to almost disappear. It was observed in 24 out of 377 primary cultures, or in 6.3 per cent. of the cases.

The classification of cases into mild, severe, very severe, and fatal groups, as revealed by clinical records, has been continued, and when taken with the bacteria observed gives a table similar to that before presented:

Table of Organisms compared with Clinical Results, July 1895, to June 1896, inclusive.

	Mild.		Severe.		Very Severe.		Fatal.		Total.	
	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
B. Diph.....	102	47.9	30	14.0	45	12.1	36	16.9	213	56
B. D. & strep.	35	50.7	9	13.0	13	17.9	12	17.4	69	18
“ staph.	9	32.1	4	14.3	9	32.1	6	21.4	28	7
B.D. St. & Sp.	12	60.	4	20.0	3	15.0	1	5.0	20	6
Staph.....	6	100.0	0	00.	0	..	0	..	6	2
Strep.....	23	100.0	..	..	..	..	..	..	23	6
Staph. & strep.	18	100.0	..	..	..	..	..	..	18	5

A comparison of this and the previous table shows them to be fairly accordant, and I am able to repeat, with greater confidence, the statement that when staphylococci, or streptococci, are associated with the diphtheria bacillus, the mortality is higher than when the latter is alone present. This is in accordance with common belief. I have, however, again found that the most serious combination is that of the diphtheria bacillus with staphylococci. The disease is more malignant, and the mortality higher than under any other conditions. It will be seen that with the diphtheria bacillus alone the mortality was 16.9 per cent.; the combination with streptococci gave 17.4 per cent., while that with staphylococci showed the deaths to equal 21.4 per cent. The mild cases exhibit a reverse proportion. Thus, of 213 cases in which the diphtheria bacillus was alone present, 47.9 per cent. were mild; with 69 cases of a mixed infection with streptococci the percentage was 50.7; and of 28 cases of mixed infection with staphylococci, the proportion fell to 32.1 per cent.

The combination of both staphylococci and streptococci with the specific bacillus is again shown to be of benign character. Such mixtures resulted in the reduction of the death rate to less than one-third that shown by the mixture of the diphtheria bacillus and streptococci, and less than one-quarter of the staphylococcus mixture. When it is considered that the records extend over a year and a half and include 565 cases, it can scarcely be concluded that this is the result of mere chance.

With regard to the effects of streptococci, or staphylococci, respectively, or associated together, the consequences have never been serious, nor has any case proved fatal. Such patients have generally been sent out from hospitals within a week, and in no instance has there been any return, or complaint of too hasty discharge.

Susceptibility according to Sex. The female sex continues to show greater susceptibility, or possibly greater exposure to infection, as the female hospital patients bear the relation of 59.2 per cent. to 40.8 per cent. of males. This proportion corresponds fairly with the admission to the Asylum Boards Hospital of London from 1888-94, inclusive. Of 11,598 cases, 54.8 per cent. were females, and 45.2 males.

Susceptibility and Mortality According to Age.

	No. of cases.	Deaths.	Per cent.
7 and under	184	44	23.9
7 to 14	92	7	7.5
14 to 21	46	1	2.2
21 to 32	55	3	5.4
			14.58

It will be noticed that four of the deaths were those of persons over 14 years of age. The ages were 16, 23, 26 and 32 years respectively. As far as statistics here are concerned this is a somewhat abnormal state of things, and may be in part accounted for by the statements that two of these patients were suffering from typhoid fever when attacked by diphtheria, and in the other cases, both females, one was under recovery from a severe uterine operation, and the other was worn out by poverty and disease. These conditions doubtless had an influence on the final result, but, taken as it is, the percentage of deaths in patients over 15 differs only by 0.4 per cent. from that given by the English statistics previously referred to.

Age predisposition and age mortality have been remarked everywhere, and are probably rightly ascribed by Lennon Browne to two causes:—Disposition to nasal obstruction and tonsil enlargement, and the tendency in the infant to membranous exudation in all acute inflammatory conditions of the throat, irrespective of contagiousness, as compared with submucous infiltration, with œdema, in the adult.

The statement made last year as to the mild type of disease prevalent in Toronto is confirmed by further experience. The

mortality for the period stated was 14.58 per cent., and for the past four years the Hospital register of 1,506 cases to December, 1895, shows 18.52 per cent. The Asylum Boards statistics, 1888-94, give a death-rate of 30.3, and in the hospitals of continental Europe the mortality is much higher. I think these figures warrant the conclusion that either the bacilli are less virulent in Toronto than in European countries, or that the resistance of patients is greater.

BACTERIOLOGICAL DIAGNOSIS AS GOVERNING THE ADMISSION AND DISCHARGE OF PATIENTS IN DIPHTHERIA HOSPITALS.*

The Isolation Hospital at Toronto was established in 1891, under the control of the Local Board of Health. Up to June 30th last there were admitted 1,690 patients said to be suffering from diphtheria, as so pronounced by their attendant physicians. Diagnosis by bacteriological methods was commenced in February, 1895, and since July of that year the discharge of patients has also been governed by this means of investigation.

The statistics for this period cover 565 cases, and, when compared with those for the preceding time, afford an opportunity for ascertaining the practical value of bacteriology when applied to the purposes indicated.

It is now generally conceded that, during the early stages of those throat affections in which a membrane is formed, it is difficult, and sometimes impossible, for those most skilled and experienced in such matters, to make, by ordinary clinical signs, a certain diagnosis. Confirmation of this was afforded by the records of the first two months, which show that in 27.9 per cent. of the cases admitted the specific bacillus was absent. After five months the percentage fell to 24.5, and it has since declined so that the average for the succeeding year is 12.4 per cent.

This decrease is in some degree due to the fact that bacteriological examinations are now frequently made, at the request of City physicians, prior to patients being sent to hospital, but it is probably more largely attributable to the influence of the new system, which leads to greater care in the selection of cases. I think it may be safely said that the limitation of the number of patients from this cause amounts

* Read at the annual meeting of the American Public Health Association held at Buffalo, N. Y., September 1896.

to about one-eighth, thus showing a corresponding saving to the institution.

Other advantages, which cannot be estimated by dollars and cents, follow the admission of the patient. If it is shown that his case is of a non-bacillary character he can be kept in an isolated ward, and thus avoid infection by the specific micro-organism—a result which would otherwise be very liable to follow. The treatment of the case is also beneficially affected by the correct knowledge at the disposal of the medical superintendent. If the diagnosis has been speedily made, the disinfection of the patient's former residence may be obviated, and the assurance that there is no danger of infection must be a great relief to the patient's friends.

It is, however, in fixing the time of discharge that bacteriological diagnosis has proved of the greatest value. It was formerly the rule that all diphtheria cases should remain in hospital for 14 days after the membrane had disappeared, or the more serious symptoms subsided, and, in the opinion of the medical superintendent, there was no danger of infection being carried out of the institution. The statistics of 1893 and 1894 show the following as the average duration of the hospital term:

1893. 236 non-fatal cases	26.3 days.
1894. 165 "	25.9 days.
Average for two years.....	26.1 days.

During the latter half of 1895, and the first half of 1896, in which discharge was governed by bacteriological methods, the average term was as follows:

1895-6. 322 non-fatal cases	22.8 days.
-----------------------------------	------------

This shows a shortening of the term by 3.3 days, amounting to a total of 1,062 days for the year, and has, of course, its economic application to both hospital and patient.

This result, though direct and decisive, does not fully represent the gain. The misleading peculiarity of averages must be here taken into account in order that the case may be properly understood. 11.4 per cent. of the patients were only detained in hospital for periods ranging from 1 to 7 days, and 8.3 per cent. from 7 to 14 days. It will thus be seen that 19.7 per cent. of the whole number were discharged within the period previously fixed for convalescence only. Of those discharged within 7 days the greater proportion was composed of non-bacillary, or false diphtheria, which usually ran the more

serious part of its course in that time. In some few cases the patients were sent to the General Hospital, but, in any event, they were not considered proper subjects for treatment in an isolation institution.

Quite a number were detained beyond the usual four weeks. Thus, 13.9 per cent. remained for between four and five weeks; 5.9 per cent. between five and six weeks; 2.1 between six and seven weeks; while one out of the 322 retained infection until the 65th day, and another until the 75th day. These prolonged cases set off those which were speedily discharged, but still did not bring the average up to the detention under the old system.

These tedious cases in which the patient is apparently quite well, but whose throat is still the hiding place of infection, constitute one of the most common means by which diphtheria is communicated, and the supply of patients continued. In one of the most extreme of these cases it was proved that the bacilli were virulent enough to cause in 43 hours the death of a guinea pig, and it may be presumed that, with human beings, the infection would have been sufficient to have produced disease. It is in the detention of these cases that bacteriological diagnosis finds its chief use. The value of the bar thus provided against the dissemination of disease cannot be represented by any money value, though even from this low standpoint it is sufficiently apparent.

In regard to the reliability of this mode of conducting hospital discharge, I may say that, while it may not be infallible, it has proved reasonably satisfactory, and with greater experience and care, may be wholly so. On two occasions, and only two, out of the 322 under observation, was there any evidence of a recurrence of the disease in the patient, or any of those with whom he was known to come in contact. One of these was an instance of recrudescence which led to the return of a girl to hospital; in the other, there was the apparent communication of the disease to a fresh patient. It cannot be positively stated that infection came from the hospital, but it seems probable that it so originated. Granting this, the failure amounts to only 0.62 per cent., which is a fairly low limit, with a prospect of further reduction.

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ANNUAL REPORT

OF THE

Local Board of Health

FOR THE

YEAR 1897.



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ANNUAL REPORT
OF THE
LOCAL BOARD OF HEALTH
FOR THE YEAR 1897.

To the Chairman and Members of the Local Board of Health :

In compliance with the provisions of the Statute, I beg to report to the Board the sanitary work done during the year now about closing, and also the sanitary condition of the City, as shown by the minute book in which are recorded the proceedings of the Local Board of Health of this City.

During the year the Board held several important meetings, and the attendance thereat by the members has been exceptionally good.

MILK SUPPLY.

The first important matter that engaged the attention of the Board for the year, was the following resolution which was referred to the Board by the City Council for consideration :

“ That it is reported that milk of a diseased nature has been and is being sold or vended in this City, therefore be it resolved that the Board of Health be requested to look into the matter and take such steps as may be deemed proper to have the same prevented in the interest of the public health.”

A very exhaustive search was made into the complaint referred to, and a number of milk dealers were examined in order to ascertain, if possible, the true facts of the case.

The Medical Health Officer explained the system adopted by him for issuing milk permits, and as a result the following resolution was adopted by the Board, viz.:

"That this Board, having heard the detailed statement of the method of milk inspection, and having reviewed the work done by the Health Department in connection with the inspection of dairies within the City of Toronto, desire to record their appreciation of the thoroughness with which the existing law has been carried into effect."

In order that a more complete method of protecting the public in the matter of milk supply could be put into force, the following resolution was also passed:

"That this Board is desirous of affording the fullest possible protection to the public against contamination and infection of the milk supply of the City of Toronto, and with a view to securing such protection the City Health Officer is hereby instructed that in future he is not to grant a permit to any dairyman or milk vendor to deal in milk unless such dairyman or milk vendor has furnished to the City Health Department the certificate of a duly qualified veterinary surgeon that the cattle from which such milk is derived have been thoroughly and carefully examined by him, and have been found free from disease, and such certificate shall be kept on file in the Health Department, and shall embrace a descriptive enumeration of the cattle examined, and a copy of such certificate shall be entered in a book to be kept by the City Health Officer. If, in the opinion of the City Health Officer, any animal in any herd is suspected to be infected with tuberculosis, such officer is hereby empowered to require the tuberculin test, as provided for in the regulations adopted by the Provincial Board of Health, and approved of by Order-in-Council, dated December 23rd, 1896. Any milk vendor or dairyman who hereafter fails to comply with the regulation embodied in this resolution shall be dealt with as the law provides; and further, that the Medical Health Officer is hereby directed to forward at once a copy of this resolution to the milk dealers of the City."

At a subsequent meeting of the Board, the time for putting the new regulations above referred to into force was extended.

ESTIMATES, 1897.

The estimated expenditure for the year 1897 was submitted by the Medical Health Officer, as follows :

General purposes..... \$21,312 10

Isolation Hospital..... 11,635 54

After explanations had been made by the Medical Health Officer, as to some of the details, these estimates were adopted by the Board, and sent on to the City Council to provide the necessary funds.

SCARLET FEVER.

During the early part of the year the Medical Health Officer reported a marked increase in the number of Scarlet Fever cases, but the disease was of an exceptionally mild type, and the number of deaths therefrom very low. Everything that could be done to stamp out the disease was done by the Medical Health Officer and his staff, and he hoped that by the middle of April the end of it would be seen.

PUBLIC ABATTOIR.

A communication was received from the Toronto Humane Society, urging the establishment of a public abattoir within the Municipality of the City of Toronto. The Medical Health Officer, to whom the matter was referred for his opinion, reported that he did not think the present an opportune time for the establishment of a public abattoir in this City, nor could he think that the same can be successfully operated until such times as legislation is obtained closing all other slaughter houses in the City, which might, by being brought into competition with the public abattoir, materially diminish its usefulness.

In view of the report of the Medical Health Officer, the Board decided to take no further action in the matter at present.

CITY WATER SUPPLY.

In the month of June, reports having been made respecting the dumping of manure and dredgings in the lake in proximity to the intake pipe, the Medical Health Officer carefully investigated the matter, and in his report to the Board he states that there was no reason for belief or suspicion that there have been any deposits of night soil anywhere in the lake in proximity to Toronto.

He further reported that analyses of the tap water for June show it to be in a very satisfactory condition, and these analyses, coupled with the fact of there being very few cases of Typhoid for the month of June, prove pretty conclusively that there has been no material contamination of the water supply of the City.

The Board was gratified to receive this report from its chief officer, and heartily concurred in the opinion therein expressed.

OUTBREAK OF SMALLPOX.

The Medical Health Officer in his first report to the Board, after summer vacation, very fully outlined the circumstances that led to the importation of cases of Smallpox into the City, in the month of August last.

The Board, after reading the report, congratulated the Medical Health Officer upon the promptness with which he acted in this matter, as undoubtedly the City would have suffered very much indeed, both financially and otherwise, if this dread disease should have secured a foothold in the City.

The cost of stamping out the outbreak was \$1,266, all of which fell upon the City, but the Board hope to be repaid this amount by the municipality from which the disease came, viz.: Belleville, Ont.

MATERNITY HOSPITALS.

Another very important matter that engaged the attention of the Board during the year was the question of Maternity Boarding Houses, as they are called, where large numbers of illegitimate children are born into the world annually, which children are, by some means or other, got rid of.

At the last Session of the Ontario Legislature, an Act was passed placing the responsibility of the existence of these houses on the municipality in which they are located, but upon examining the Act, it has been found to be unworkable, and certain amendments have been suggested that will help the matter very much, and if such amendments are passed by the House, it is expected that the City Council will pass a By-law putting the Act into force at once. The regulations provided in the Act are very strict, and no doubt the present evil will soon be abated.

MARCHMENT'S DUMP.

The Medical Health Officer, in obedience to the request of the Board, submitted a report on the complaint of certain persons regarding an alleged nuisance at the dump on the River Don, owned and operated by Marchment & Co. The report stated that he does not consider the dump in its present state constitutes a nuisance dangerous to the public health. In view of this opinion, the Board decided to take no further action in this matter.

DREDGING.

The usual amount of dredging in the bay, in order to purify the water, was done under the supervision of the City Engineer, and in view of the fact that not a single complaint was made during the year the work must have proved a great benefit to the City.

ICE CUTTING.

No complaints were made during the year as to the

quality of ice supplied citizens for domestic use. The Medical Health Officer, through his inspection, has kept a strict watch on the ice dealers of the City with the result that the ice regulations are carried out almost to the letter.

CLEANING THE CITY.

During the winter months much rubbish was allowed to collect in the back yard, and on the first appearance of spring, in order to prevent the spread of disease, the usual house to house inspection had to be carried out. Large quantities of refuse were carefully gathered up and removed by the Street Commissioner's staff, and the general health of the City thereby greatly improved. This work is done systematically, and great credit is due the officials in charge of the same.

ISOLATION HOSPITAL.

The work of this Hospital has been very heavy during the year, and the staff at that institution have done their work nobly and well.

PLUMBING AND FOOD INSPECTION.

The work of the officials connected with this branch of the Health Department has been done quietly, and to the satisfaction of the Board.

SANITARY CONDITION OF THE CITY.

The sanitary condition of the City has been exceptionally good during the year, notwithstanding the number of persons who visited us in connection with the many conventions held here during the past eight months.

The Medical Health Officer's report, which is annexed hereto, shows to the very smallest detail the work done under his supervision during the year.

Your obedient servant,

JOHN BLEVINS,

City Clerk and Secretary of Local Board of Health.

REPORT
ON THE
SANITARY CONDITION
OF THE
CITY OF TORONTO
ALSO AN
Account of the Operations of the Board of Health
and the Vital Statistics
FOR THE YEAR 1897
BY
CHARLES SHEARD, M.D.,
Medical Health Officer.

LOCAL BOARD OF HEALTH,

. . 1897 . .

ALDERMAN JAMES CRANE, *Chairman.*

HIS WORSHIP THE MAYOR.

ALDERMAN THOMAS ALLEN.

" J. J. GRAHAM.

" W. T. R. PRESTON.

" BERNARD SAUNDERS.

JAMES JOLLIFFE, *Esq.*

JOHN BLEVINS,

Secretary.

CHARLES SHEARD, M.D.,

Medical Health Officer.

REPORT
ON THE
Sanitary Condition of the City of Toronto
ALSO AN
ACCOUNT OF THE OPERATIONS OF THE BOARD OF
HEALTH, AND THE VITAL STATISTICS
FOR THE YEAR 1897.

To the Chairman and Members of the Local Board of Health :

GENTLEMEN,—I have the honor to submit the Annual Report of the Medical Health Department for the year ending October 31st, 1897. The department has been conducted on practically the same lines as in previous years, and, with the exception of a comparatively light epidemic of scarlet fever, which invaded the City in the first half of the year, the sanitary condition of the municipality has been in a high degree satisfactory.

The scarlet fever which prevailed during the earlier months of the year was of a very mild type, but the number of cases constitute a sufficient reason that the outbreak should be considered in the light of an epidemic.

We had during the entire year 1,394 cases, which occurred in months, as follows :

Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
44	71	104	172	265	205	212	180	59	26	26	30

Seasonal influence, which is generally considered as having a marked effect on the occurrence of the disease, has not in this epidemic been so demonstrated. The comparative cessation of the disease during the months of

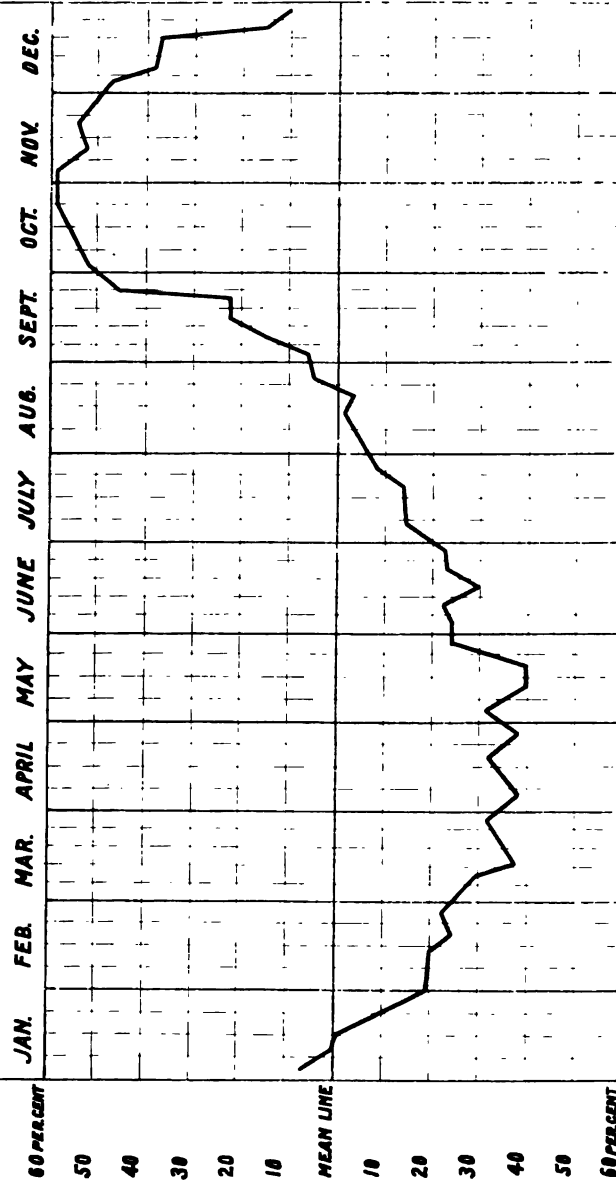
July, August and September may reasonably be ascribed as the result of the school vacation. The mildness of type has contributed materially to the spread of infection, as in densely populated districts the parents of children often consider the services of a physician unnecessary, and the case thus escapes being reported to the Health Department, while quarantine and disinfection are not often observed, and always imperfectly carried out. Again, the mildness of the case induces the physician in attendance to consider unnecessary the more thorough disinfecting methods resorted to in the malignant form of the disease, and in mild cases continued isolation becomes correspondingly more difficult.

School influence may be recognized among the chief factors in the spread of the infection. The concentrating of children in one room, sometimes imperfectly ventilated; the methods of communication peculiar to child life; the nature of the work in the Kindergarten rooms; the emanations from the body of a child in the stage of protracted convalescence; the distribution of urine by the feet of children who have to use urinals of imperfect construction, and the dissemination of the dried particles through the school rooms, constitute a source of danger, as it has been shown that urine from those suffering from scarlet fever may be infected from twelve to fourteen weeks after the commencement of an attack. All these tend to make the school the distributing focus.

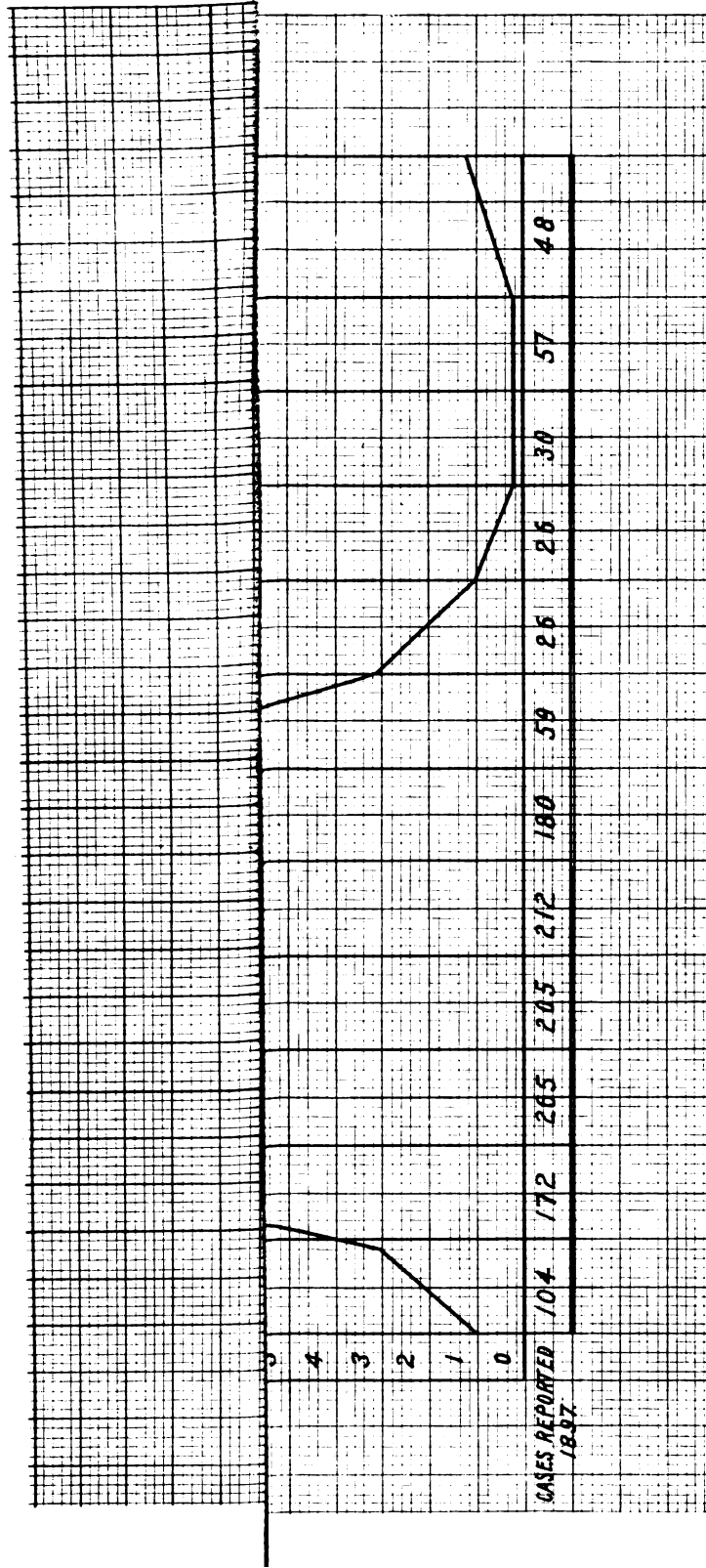
The etiology of scarlet fever is not yet definitely settled. In recent years several observers have attributed a specific causal relationship to some one or other of the various forms of bacteria which have been found in the human body, and Dr. Klein and others have expressed their belief in a specific microbe—a streptococcus of scarlet fever, somewhat similar to the organism found in

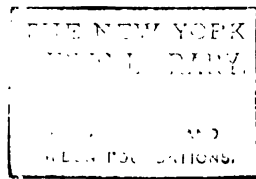
CHART A.

— SCARLET FEVER DEATHS, ENGLAND AND WALES, —
FOR 30 YEARS—1861-90



THE MEAN LINE REPRESENTS AN AVERAGE WEEKLY NUMBER OF 44 DEATHS.





erysipelas, and puerperal septicæmia. This may be the streptococcus pyogenes under a different name.

Dr. Clifford Allbutt, in his recent *System of Medicine*, states that "A toxine has been extracted from the urine, of which the chemical composition has been ascertained, and to which the name *Scarlatinine* has been given. Its poisonous nature has been proved by injecting into some of the lower animals, but the effects have been in no way suggestive of the phenomena of scarlet fever, nor is there any valid reason for regarding it as anything more than a product of the scarlatinal process. It is readily distributed, and rendered inert by oxidation."

Certain it is that the scarlet fever patient is capable of imparting infection from the very commencement of his illness, but the time at which his infectivity ceases is not only very difficult to determine, but varies widely in different cases. It is a good rule and practice to regard six weeks from the appearance of the rash as the minimum length of quarantine. After this the patient's release will be dependent upon the end of peeling, and upon the cessation of any discharges from the ears, nose, eyes, mucous cavities, etc.

An otorrhœa may be the cause of the retention of infection for a period of six months, and the desquamation, usually completed in six or eight weeks, may exist and be contagious for three months. There is every reason to regard the skin-peeling, which follows a definite relapse of the disease, as being no less a source of danger than the original desquamation. The patient is most infectious when the disease is at its height, and at the decline of the febrile stage, when a fine powdering is noticeable on the face and other parts.

Dr. Clifford Allbutt states that "a certain proportion of cases discharged from a fever hospital, perhaps two or three

per cent., will communicate the disease to other members of their household on their return, in spite of the most scrupulous care in their final disinfection. It is possible that the respiratory tract may remain charged with infection for several days after a person has ceased living in an infected atmosphere, and as we are unable to make sure of thoroughly disinfecting the air passages of a living person, it is wise to warn the person against the possible risk of a too free intercourse with other members of the family for several days after the return home."

AGE PREDISPOSITION AS SHOWN BY OCCURRENCE OF SCARLET FEVER
BETWEEN NOV. 1ST, 1896, AND OCT. 31ST, 1897.

Under 1 Year.		1 to 5 Years.		5 to 10 Years.		Over 10 Years.	
Cases.	Per ct.	Cases.	Per ct.	Cases.	Per ct.	Cases.	Per ct.
20	1.5	543	42.3	492	38.3	217	16.9

Of the 1,394 cases reported, the ages of 112 were not stated, leaving the above total (1,282).

MORTALITY OF SCARLET FEVER AT VARIOUS AGES AS SHOWN BY RECORDS
BETWEEN NOV. 1ST, 1896, AND OCT. 31ST, 1897.

Under 1 Year.		1 to 5 Years.		5 to 10 Years.		Over 10 years.	
Deaths.	Per ct.	Deaths.	Per ct.	Deaths.	Per ct.	Deaths.	Per ct.
3	5.1	31	53.4	15	25.8	9	15.5

. The age was not reported in 5 cases; these, with the above 58 cases, make a total of 63 deaths, resulting in 1,394 reported cases, and equally 4.51 per cent. In the 69,752 cases cited by Dr. Allbutt as occurring at the Asylums

Board Hospitals, between 1871 and 1893 inclusive, the total mortality was 8.3 per cent. From this and other records, and for comparative purposes, the conclusion is reached that the recent epidemic of scarlet fever in Toronto was of an exceedingly mild character.

Since the last meeting of the Board we have had the misfortune of having imported into the City two cases of smallpox. The circumstances in connection with the cases are as follows :

On Saturday, July 31st, about midnight, I received a communication, by telephone, from Dr. Tracey, Health Officer of Belleville, that there had gone from that city to Toronto, by one of the Richelieu and Ontario Navigation Company's steamers, a man named Whitney, supposed to be infected with smallpox, and under observation in the city of Belleville as a suspect. I immediately took steps to ascertain the name of the boat, with a view to intercepting her before reaching the City dock. I communicated with Mr. Dolan, the Local Passenger Agent of the Company, and obtained his co-operation as to the stoppage of the steamer.

On Sunday morning I procured the services of a tug, and, accompanied by Mr. Dolan, proceeded to the eastern channel in waiting for the approaching steamer "Passport." Between 6 and 7 o'clock Mr. Dolan hailed the vessel and ordered her to stop, when I went on board. On examining her passengers I found a man named Whitney, who, apparently without the knowledge of the officers, had embarked as a stowaway. I examined him and found him to be in the vesicular stage of smallpox. I had him at once removed by one of the life-boats of the steamer, and rowed up the Don to the Smallpox Hospital which was in readiness to receive him. The fact that whilst on board he had been more or less in contact with the crew and some of the passengers, necessitated the detention of the vessel, passengers and crew, for purposes of disinfection.

Considering the particular circumstances of the case, rendering probable the invasion of a smallpox epidemic in the City of Toronto, I considered the situation grave enough to warrant me in reporting the steps taken to his Worship the Mayor, at whose suggestion the action of the Health Officer was, on the afternoon of Sunday, August 1st, laid before himself, the City Solicitor, the Chief of Police, Assistant Collector of Customs Douglas, Landing Wharf Inspector Munroe, Alderman Crane, Chairman of the Local Board of Health, and Dr. Cassidy of the Provincial Board of Health, all of whom endorsed the action taken by me.

Upon further investigation I found that Whitney had a travelling companion named Bullivant, who reached the City on Friday, July 30th, by train. An officer of the Health Department was immediately sent in search of him, with the satisfactory result that we had him and his luggage in possession of the Department on the evening of Sunday, August 1st.

The steamer "Passport" and crew, with the exception of the captain and one passenger, the latter escaping, were detained until the steamer was disinfected. All the passengers and crew were vaccinated, and re-vaccinated, and before being discharged showed evidence of successful inoculation.

Everything that could be done for the comfort of the passengers was done, and as little annoyance as possible given them whilst they were in quarantine. The captain was released on the evening of Wednesday, August 4th, and the remaining passengers, with their hand baggage, were liberated on Friday and Saturday, the 6th and 7th of August, and the disinfection of the steamer and cargo was completed on the evening of August 8th, and on the 9th of August she was released.

As a result of the conference on Sunday, August 1st additional authority was given me by acting collector

Douglas, as quarantine officer for the Dominion Government in the unorganized port of Toronto, to act for him in this particular instance.

The suspect Bullivant became ill on August 12th, and on Sunday, August the 15th, developed the smallpox rash. As he had been promptly vaccinated on his entrance into the Isolation Hospital he only suffered from varioloid.

I am happy to state that both patients made a satisfactory recovery, although Whitney still bears considerable evidence of disfiguration. None of the nurses or attendants contracted the disease, and the infection did not reach the citizens.

From the account of the affair given by Whitney, there is every reason to believe that the Health Officer of the City of Belleville, did not take very energetic means to prevent Whitney reaching Toronto, and if proper measures had been adopted by the City of Belleville, and prompt action taken by them, the City of Toronto would not have been put to the consequent expense in connection with the case, or the steamboat company and passengers the annoyance and loss which have been entailed upon them.

With the object of hearing from the authorities in Belleville their views upon the question, the Chairman of the Local Board of Health, together with myself, visited that City, and had an interview with its Mayor and City Solicitor. They disclaimed liability, and attempted to defend themselves upon the ground that neither they nor their Board of Health had any official knowledge of the existence of such a case in their midst, and if there was any lack of action it must have been wholly on the part of their Local Health Officer, and not of their Board.

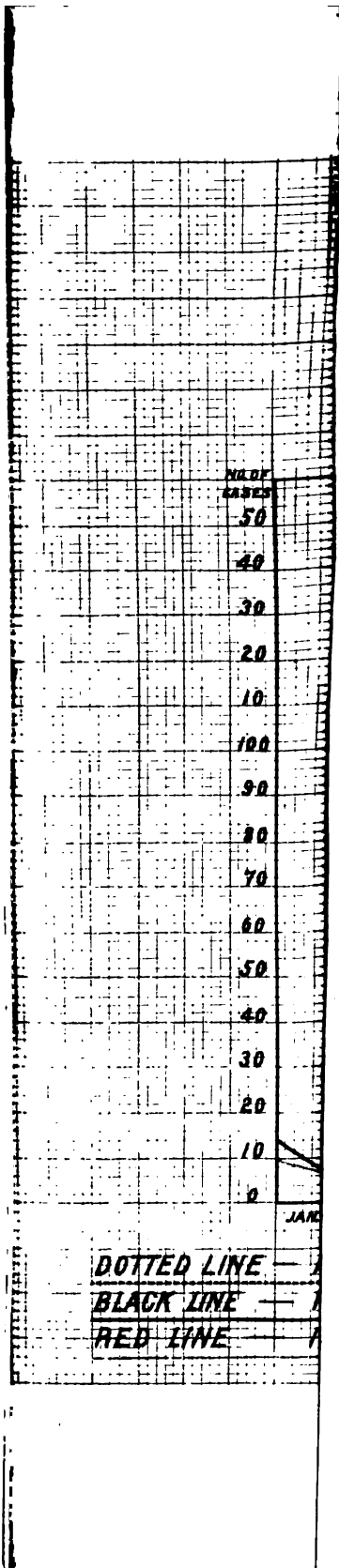
CONTAGIOUS DISEASES.

Diphtheria.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1892..	141	182	150	163	141	122	75	41	75	195	174	146	1,625
1893..	115	79	100	56	84	57	20	30	21	40	30	42	683
1894..	40	28	21	23	26	15	12	11	13	32	37	81	338
1895..	81	52	39	33	46	41	34	16	24	38	49	53	506
1896..	73	47	47	30	45	37	28	23	25	50	64	93	562
1897...	63	80	85	78	78	52	45	50	35	38	65	70	719

Scarlet Fever.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1892..	49	99	74	63	55	47	29	21	38	53	75	68	671
1893..	100	70	50	52	77	48	56	29	20	33	35	24	554
1894..	28	33	47	34	55	18	25	24	25	29	20	24	371
1895..	17	18	14	5	6	7	8	9	6	6	5	12	113
1896..	3	8	7	2	3	4	5	3	18	44	44	71	212
1897..	104	172	265	205	212	180	59	26	26	30	57	48	1,384



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ASTOR, LENOX AND
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Typhoid Fever.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1892..	27	16	9	11	25	19	25	57	88	69	49	31	426
1893..	35	111	239	43	15	13	6	20	27	27	25	15	476
1894..	11	12	7	51	11	6	6	34	38	29	34	10	249
1895..	8	15	7	5	5	6	17	37	62	141	47	18	368
1896..	12	2	6	10	5	6	25	75	105	56	24	10	384
1897..	7	13	11	9	12	5	11	19	33	44	15	20	199

**COMPARISON OF THE DEATH RATES OF VARIOUS UNITED STATES CITIES
WITH THAT OF TORONTO, 1896-1897.**

Cities.	State.	Population.	Mortality.	Death Rate per 1,000
Omaha	Neb.	140,757	929	6.6
St. Paul	Minn.	215,582	1,434	6.6
Denver	Col.	150,000	1,571	10.4
Kansas City	Mo.	175,000	1,873	10.7
Rochester	N. Y.	170,000	2,301	13.5
Syracuse	N. Y.	110,000	1,579	14.3
Louisville	Ky.	215,572	3,105	14.4
Chicago	Ill.	1,619,226	23,257	14.4
Cleveland	Ohio	230,000	4,839	14.6
Milwaukee	Wis.	260,000	3,904	15.0
TORONTO	ONT.	195,977	2,968	15.1
Wilmington	Del.	72,500	1,204	16.6
Richmond	Va.	100,000	1,658	16.6
St. Louis	Mo.	560,000	9,425	16.8
Cincinnati	Ohio	350,000	5,916	16.9
Pittsburg	Pa.	282,500	4,907	17.3
Hartford	Conn.	72,000	1,257	17.4
Manchester	N. H.	56,000	1,136	18.7
San Francisco	Cal.	360,000	6,760	19.3
Providence	R. I.	150,000	2,955	19.7
Brooklyn	N. Y.	1,125,000	22,501	20.0
New Haven	Conn.	110,000	2,019	20.2
Washington	D. C.	275,500	5,904	21.4
New York	N. Y.	1,934,077	41,622	21.5
Lowell	Mass.	85,700	1,901	22.1
Boston	Mass.	516,305	11,634	22.5
Jersey City	N. J.	187,098	4,357	23.3
Memphis	Tenn.	56,134	1,348	24.0
Charleston	S. C.	65,165	1,869	28.6

COMPARATIVE DEATH-RATE OF VARIOUS CITIES IN GREAT BRITAIN
1896-97.

Cities.	Country.	Population.	Mortality.	Death rate per 1,000.
Toronto .....	.....	195,979	2,968	15.1
Bradford	England..	228,809	3,840	16.5
Portsmouth	" ..	178,639	3,009	16.6
Leicester	" ..	198,659	3,376	16.7
Bristol	" ..	230,623	3,961	16.9
Edinburgh	Scotland ..	276,514	4,751	16.9
Newcastle	England..	212,223	3,981	18.5
London	" ..	4,421,955	83,511	18.6
Leeds	" ..	402,449	7,670	18.8
Hull	" ..	220,844	4,245	18.9
Sheffield	" ..	347,278	6,797	19.3
Glasgow	Scotland..	705,052	14,619	20.4
Birmingham	England..	501,241	10,600	20.8
Liverpool	" ..	641,063	14,366	21.9
Manchester	" ..	529,561	12,184	22.6
Dublin	Ireland ..	349,594	8,856	24.9
Belfast	" ..	300,000	6,953	25.1

COMPARATIVE DEATH-RATE OF VARIOUS CANADIAN CITIES, 1896-1897.

Cities.	Province.	Population.	Mortality.	Death Rate per 1,000.
Stratford	Ontario ..	9,992	103	10.3
Guelph	" ..	11,082	121	10.9
London	" ..	32,618	390	11.9
St. Catharines	" ..	9,644	132	13.6
Chatham	" ..	9,521	132	13.8
Hamilton	" ..	51,527	730	14.1
St. Thomas	" ..	10,898	160	14.6
Windsor	" ..	10,857	163	15.0
Belleville	" ..	10,430	157	15.0
Toronto	" ..	195,979	2,968	15.1
Kingston	" ..	20,262	341	16.8
Brantford	" ..	13,413	268	19.9
Ottawa	" ..	46,449	1,082	23.3
Quebec	Quebec ..	63,432	1,325	20.8
Montreal	" ..	265,100	6,559	25.0
Cities of Province of Ontario, average .....	.....	432,675	6,747	15.5
Province of Ontario .....	.....	2,263,492	24,857	10.9
Province of Quebec .....	.....	1,545,999	31,004	20.0

PLUMBING AND DRAINAGE DEPARTMENT, 1897.

MONTH.	APPLICATIONS FOR INSPECTION.			INSPECTIONS MADE.						NOTICES MAILED.	PERMITS ISSUED.							
	1894-'95.	1895-'96.	1896-'97.	Plumbing.	Drainage.	Smoke Tests.	Total Inspections.	Plumb- ing and Drainage			Plumb- ing only.		Drainage only.		Total.			
								Per- mits.	Build- ings.		Per- mits.	Build- ings.	Per- mits.	Build- ings.	Per- mits.	Build- ings.		
November, 1896..	237	302	314	212	174	48	434	135	22	34	25	30	12	13	59	77		
December, 1896..	168	204	241	136	129	60	325	173	14	24	16	18	17	25	47	67		
January, 1897 ..	153	158	230	152	120	39	311	164	4	4	14	18	7	7	25	29		
February, 1897 ..	62	109	268	208	95	65	368	220	11	22	14	20	8	10	33	52		
March, 1897	130	73	332	251	123	80	454	248	21	36	20	25	7	8	48	69		
April, 1897	174	175	273	150	128	72	350	225	31	45	28	29	25	33	85	107		
May, 1897	322	239	299	152	165	92	389	207	25	31	26	33	17	25	68	89		
June, 1897	250	298	317	167	143	78	388	213	33	52	36	38	23	31	92	121		
July, 1897	221	266	365	207	185	64	456	209	42	58	27	30	15	17	84	105		
August, 1897	244	265	314	155	158	80	398	236	32	44	21	26	21	37	74	107		
September, 1897..	224	295	350	232	177	70	479	234	19	24	32	17	16	23	67	84		
October, 1897....	302	344	368	197	149	98	444	214	39	46	47	53	21	25	107	123		
Totals	2,487	2,728	3,671	2,219	1,736	836	4,791	2,528	293	420	306	356	190	254	789	1,080		

MEAT AND FOOD INSPECTION.

From November 1st, 1896, to October 31st, 1897, the following numbers of animals have passed through the market for export and home consumption:

Cattle	134,335
Hogs	211,486
Sheep	90,497
Calves	5,762
Total	<u>442,080</u>

Of the above cattle your Inspector intercepted 63 which were affected with actinomycotic or other tumors. These were subjected to competent veterinary inspection and slaughtered, and where the disease was found to be entirely local, the affected parts only were destroyed. The carcasses of 4 cattle and 1 hog were cremated.

Thirteen cattle, 132 hogs, 87 sheep and 10 calves died, or were killed in transit, these were consigned to the rendering tank to be converted into patent manure, and thus kept out of the food supply of the City.

SHOP INSPECTIONS.

Number of inspections of butcher shops other than those in public markets	4,722
Number of shops and warehouses where poultry and fish are sold.	1,605
Number of shops where bread is sold, ...	<u>5,147</u>
Total	11,474

MARKET INSPECTION.

The St. Lawrence Market is visited daily, so also, in the season, is the fruit market and Yonge Street Wharf. The other markets are taken with the adjoining streets.

CONFISCATIONS.

The following is the list of confiscations made during the period aforesaid :—

2,279 lbs. of beef.	234 baskets of diseased peaches.
754 lbs. of mutton.	19 barrels of apples.
341 lbs. of veal.	1 barrel of pears.
490 lbs. of pork and ham.	13 baskets of pears.
3,400 lbs. of hearts and kidneys.	63 cases of pears.
54,082 lbs. of fish.	36 baskets of plums.
207 gallons of oysters.	50 baskets of cherries.
20 barrels of shell oysters.	57 baskets of raspberries.
32½ cases Finnan haddies.	8½ cases of strawberries.
21 kegs salt herrings.	6 cases of thimbleberries.
9½ boxes of smelts.	32 quarts red currants.
39½ baskets of ciscoes.	5 baskets of huckleberries.
520 mackerel.	20 cases of melons.
74 Finnan haddies.	3 barrels of melons.
6 lobsters.	12 pine apples.
2 fore quarters of venison.	77 mats of figs.
14 lbs. bear's meat.	2 boxes of figs.
137 turkeys.	20 hampers patent yeast.
3 geese.	45 bushels of potatoes.
127 ducks.	5 barrels sweet potatoes.
400 chickens.	17 baskets tomatoes.
	5 baskets cucumbers.

BUTTER INSPECTION.

The following is the list of butter confiscated for being short weight, and distributed as follows :—

60 rolls to the	Hospital for Sick Children.
19 " "	House of Providence.
24 " "	Girls' Home.
25 " "	Boys' Home.
19 " "	Working Boys' Home.
23 " "	Children's Shelter.
42 " "	House of Industry.
25 " "	Protestant Orphans' Home.

ROBERT AWDE,
Inspector.

SANITARY BRANCH.

Classification of Complaints Received at Office.

Privy pits, full and foul	1,521
Dry earth closets, full and foul	93
Foul and wet cellars	300
Filthy yards and premises	369
Defective plumbing and drainage	644
Garbage or manure thrown on lots or in lanes	322
Foul stables	91
Water on vacant lots	47
Water under houses	42
Foul wells and cisterns	28
Foul sewers	82
Premises not drained	45
Miscellaneous	182

Summary in Detail of the Work Done in the Sanitary Branch.

Total number of complaints	3,766
“ “ inspections of nuisances complained of	7,710
“ “ notices and letters issued respecting complaints	2,320
“ “ house to house inspections	8,978
“ “ inspections of livery stables	48
“ “ “ rag shops	18
“ “ “ slaughter houses	36
“ “ “ milk depots	1,789
“ “ “ cow byres	247

Cases prosecuted in the Police Court for the Year ending October 31st, 1897.

Full and foul privies	40
Establishing new privy pit	1
Foul dry earth closets	4
Defective plumbing and drainage	9
Filthy water closets and no water-supply	1
Foul cellars	5
Foul well	1
Filthy yards	2
Filthy stables	3
Throwing foul refuse on vacant lot	1
Water in excavations	2
No drainage	1

Keeping cows within prescribed limits	2
Bringing milk into the City from a farm where Scarlet Fever existed	3
Breach of Plumbing By-law ..	7
Neglecting to report contagious diseases	3
Breach of quarantine regulations ..	2
Breach of ice regulations...	6
Selling impure fruit (bananas)	1
No. of summonses issued	63
“ cases in Court, Nov. 1st, 1896.....	3
“ cases withdrawn (work done)	44
“ “ dismissed	5
“ “ fined	15
“ “ still in Court (Nov. 1st, 1897)	2
	66

Summary of fines imposed :—

Nature of Offence.	No. of Fines.	Amount of Fines.
Throwing refuse on vacant lot.....	1	\$ 5.00 and costs on 14 days.
Selling impure fruit (bananas).....	1	7.00 “ 14 “
Breach of ice regulations	4	25.00 “ 14 “
Breach of quarantine regulations (Scarlet Fever)	1	10.00 “ 14 “
Breach of P. H. Act (failure to re- port contagious disease).....	2	10.00 “ 14 “
Breach of Plumbing By-law.....	6	20.00 “ 14 “
Total amount of fines.....		\$77.00

ICE REGULATIONS.

1. No person shall cut, harvest, or in any way obtain any ice within or without the limits of the City of Toronto, which is intended either for domestic use or for cooling purposes within the said limits, or shall sell, store or distribute within the said limits, any such ice, without having first obtained a permit therefor from the Medical Health Officer of the said City, for which a fee of one dollar shall be paid.

2. No ice shall be sold, delivered or stored within the City of Toronto for domestic use or for cooling purposes (except as hereinafter specially provided), which shall be produced by the freezing of water which, on analysis, shall be shown to be other than that of absolute chemical purity, and upon bacteriological examination shall show more than 80 colonies of bacteria per cubic centimeter.

3. All ice cut, harvested or intended for cooling purposes only, shall be housed forthwith, after being cut, and when the ice house to which said ice is consigned shall be filled, or shall, in the opinion of the Medical Health Officer, have received its consignment for the season, the said house shall be closed and sealed by the Medical Health Officer or the Sanitary Inspector, and it shall not be opened, nor any ice removed therefrom, save and except with the consent in writing of the said Medical Health Officer.

4. No permit shall be granted in pursuance of these regulations to cut, harvest, sell, store, deliver or obtain ice for domestic use or for cooling purposes (except in cases provided for in section 5 of these regulations), from any portion of the Toronto Bay, Ashbridge's Bay, the River Don, the Humber, or in or from any pond, bay, or body of water which has not first been approved of by the Medical Health Officer.

5. The said Medical Health Officer may grant permission for ice to be cut and stored for cooling purposes only from the Toronto Bay, and other water in such places and parts as he may select, the said ice to be cut and harvested under the direction of the said Medical Health Officer, and to be housed and stored in houses to be approved of by said Medical Health Officer, the said houses, immediately after receiving such ice, to be closed and sealed by said Medical Health Officer, and to be opened only with his permission and under his inspection.

6. The Medical Health Officer may grant permission for ice to be delivered for cooling purposes, to tradesmen and others, excepting milk-dealers, dairymen, hotel and restaurant keepers, who have safes or receptacles for the storing of the same, which have been approved by the Medical Health Officer, or a Sanitary Inspector of this Board, and who do not retail or sell ice ; provided that any dealer in ice supplying ice to such party or parties for such purposes, shall, before beginning to deliver the same, inform the said Medical Health Officer of the names, addresses and occupations of all parties to whom such dealer is desirous of delivering such ice.

7. All ice to be delivered for cooling purposes shall be carried for delivery in wagons to be approved of by said Medical Health Officer, and which shall be used for no other purpose.

8. All dealers supplying ice to such persons shall, on delivering the same, place and store said ice in the receptacles or safes approved as aforesaid by the said Medical Health Officer or Sanitary Inspector,

and shall immediately thereafter secure and seal the same, and the said receptacles or safes shall not, without the consent in writing of the said Medical Health Officer, be opened except by the dealer or dealers supplying the said ice when making their next delivery.

9. All dealers in such ice, before obtaining a permit to deliver ice for cooling purposes, shall enter into good and sufficient bonds, to the satisfaction of the said Medical Health Officer, that no such ice shall be delivered to any person or persons than those named and approved by the said Medical Health Officer, and that these regulations shall be faithfully observed and performed.

10. No person shall store in the same building, ice which has been cut or harvested for cooling purposes only, with ice intended for domestic use.

11. Any ice obtained from a source not approved of by the said Medical Health Officer, and stored or used, or intended to be stored or used, within the limits of the said City of Toronto, shall be liable to seizure and confiscation by the Medical Health Officer or by any Sanitary Inspector.

12. Any person convicted of a breach of any of the provisions of these regulations shall forfeit and pay, at the discretion of the convicting Magistrate, a penalty not less than five dollars, and not exceeding twenty dollars for each offence, and in default of payment of the said penalty and costs forthwith, the said penalty and costs, or costs only, may be levied by distress and sale of goods and chattels of offender, and in case of there being no distress found out of which such penalty can be levied, the convicting Magistrate may commit the offender to the common jail of the City of Toronto, with or without hard labor, for any period not exceeding one calendar month, unless the said penalty and costs be sooner paid.

Before any ice is drawn from the locality mentioned in the permit, a ticket is to be given to the driver by the Medical Health Inspector for the delivery of the same, and the counter check is to be returned by the driver after such delivery.

AMBULANCE REPORT.

Chas. Sheard, Esq., M.D., Medical Health Officer :

Total number of calls received from Nov. 1st, 1896 to Oct.

31st, 1897

Removed to General Hospital—

Typhoid fever	76	
Diseased bones	2	
Blood poison	5	
Kidney trouble	1	
Chickenpox	3	
Measles	14	
Gangrene	1	
Mumps	3	
Erysipelas	15	
	—	120

Removed to Montague Hospital—

Typhoid fever		1
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Removed to St. Michael's Hospital—

Typhoid fever	24	
Erysipelas	1	
Inflammation of throat	1	
Blood poison	1	
	—	27

Removed to Grace Hospital—

Typhoid fever	14	
Blood poison	1	
	—	15

Removed to Victoria Hospital for Sick Children—

Typhoid fever		4
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Removed to Western Hospital—

Typhoid fever		7
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Removed to Isolation Hospital—

Diphtheria	404	
Scarlet fever	272	
	—	676

Removed to Smallpox Hospital—

Smallpox		2
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Removed to other houses		4
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Total No. of calls where ambulance was not required		15
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871

Total amount collected..... \$51.00

Your obedient servant,

F. HAGUE.

MORGUE REPORT.

Charles Sheard, M.D., Medical Health Officer :

Total number of bodies placed in Morgue :

1896 November.	0	1897 May.....	8
" December	1	" June	2
1897 January.....	2	" July	2
" February.....	0	" August	3
" March	1	" September....	4
" April	0	" October	5
	<u>4</u>		<u>24</u>
			4
		Total.....	28
Male.....	22	Adults.....	21
Female	6	Children	7
	<u>28</u>		<u>28</u>

Your obedient servant,

F. HAGUE.

REPORT OF MEDICAL SUPERINTENDENT OF ISOLATION HOSPITAL.

ISOLATION HOSPITAL,

November 23rd, 1897.

Charles Sheard, Esq., M.D., Medical Health Officer, Toronto :

Sir,—I have the honor to submit the following report regarding the patients in the Isolation Hospital during the year ending November 22nd, 1897 :

The total number of Patients. There were in the Hospital during the year 796 patients of all kinds. The year commenced with 46 patients in the Hospital. Up to the end of the month 14 more were admitted. In December 88 were admitted ; in January, 1897, 92 ; in February 86 ; in March 74 ; in April 90 ; in May 82 ; in June 54 ; in July 34 ; in August 32 ; in September 28 ; in October 43, and to November 22nd, when the year closed, 35 were admitted.

Of the 796 patients, 511 were admitted for diphtheria ; 280 for scarlet fever ; 2 for measles ; 1 for chickenpox, and 2 for smallpox.

During the year 91 died, of whom 11 were moribund when they reached the Hospital. The general death rate was a fraction under

11½ per cent. if the moribund cases are included, and a fraction over 10 per cent. if they are excluded.

Diphtheria. In regard to the patients belonging to this class, a swab from the throat or nose, or from both throat and nose when indicated, was taken in each case and sent to the Medical Health Laboratory, where Professor Shuttleworth submitted it to microscopical examination and culture, and on this the diagnosis was based. No departure from this procedure was tolerated or took place. The result was that 80 cases had to be struck from the list of diphtheria patients, so that, instead of 511, there were 431 cases of real diphtheria to be dealt with during the year.

Of the 431 cases, 189 were tonsillar, 48 tonsillar-pharyngeal, 6 pharyngeal, 114 naso-pharyngeal, 50 laryngeal and 24 laryngo-naso-pharyngeal. There were 53 complications with scarlet fever, many of the cases exhibiting all the characteristics of a mixed infection from the inception of the illness, others within a very few hours, and some at varying periods during the progress of the malady. The complication, doubtless, added materially to the danger of the situation, and contributed something towards the slightly increased mortality rate for the year.

The deaths, including 11 moribunds, amounted to 79. As usual not one of them occurred in that class which includes the great majority of diphtheria patients everywhere, viz.: the tonsillar, the tonsillar-pharyngeal and the pharyngeal class. Forty-five were naso-pharyngeal, 18 laryngeal and 16 laryngo-naso-pharyngeal. Three of the moribund were naso-pharyngeal, 7 laryngeal and 1 laryngo-naso-pharyngeal. Including the moribunds, the death rate was a fraction over 18½ per cent., and excluding them it was a fraction under 16½ per cent.

During the year anti-toxin was employed in a few cases, 15 in all. It was used not as a substitute for, but as a supplement to the ordinary treatment. Since November 16th, 1894, when the first hospital patient was so treated, 48 patients have had anti-toxin administered to them by various physicians. The recoveries were 34, and the deaths 14, or a mortality of a fraction over 29 per cent. During the same period, and including the anti-toxin cases, 1,191 diphtheria patients were dealt with at the Isolation Hospital. The deaths numbered 194, and of these 37 were moribund when brought to the Hospital, which shows a death rate during the period referred to, if we include the moribund cases, of 16½ per cent., and if we exclude the moribund cases, as in fairness we should, is 13½ per cent.

Scarlet Fever. Of the 280 cases of scarlet fever, 176 were S. Simplex, 92 S. Anginosa and 12 S. Maligna. Nephritic complication existed in all the Maligna cases, in a few of the Anginosa cases, but in none of the Simplex cases. Adenitis was present in most of the severe cases. Pyæmia of a severe form occurred in 3 of the cases, and in one of them it proved fatal. There were, in all, 11 deaths, the death rate being a fraction under 4 per cent.

Measles, Chickenpox, Smallpox. Of the two cases of measles, one was sent in by mistake for scarlet fever, and recovered, while the other, which was complicated with scarlet fever, died. The chickenpox case, which was sent to the Hospital by mistake for scarlet fever, recovered. The smallpox cases also recovered. One was confluent and severe, and the other discrete and mild. The smallpox patients were kept in a building, erected specially for smallpox purposes, at a proper distance from any other house, and yet sufficiently near the Isolation Hospital proper and the disinfecting station for effective supervision and management.

Respectfully submitted.

G. TWEEDIE, M.D.

REPORTS MADE TO THE MEDICAL HEALTH OFFICER

ON

Work Done in the Bacteriological Laboratory

BY

E. B. SHUTTLEWORTH, PHAR.D., F.C.S.

REPORT ON CITY WATER SUPPLY.

OCTOBER 31st, 1897.

CHARLES SHEARD, Esq., M.D.,

Medical Health Officer, Toronto :

SIR,—I herewith append the results of the weekly bacteriological examinations of the water supply, as taken from the laboratory tap in the St. Lawrence Hall. The figures relate to colonies of bacteria per cubic centimetre :

1896.		1897.	
Nov.	7.....	495	May 3..... 2,965
"	14.....	275	" 11..... 415
"	21.....	930	" 20..... 575
"	28.....	6,475	" 28..... 760
Dec.	5.....	1,120	June 5..... 370
"	12.....	695	" 14..... 170
"	19.....	9,810	" 21..... 315
"	28.....	6,035	" 28..... 455
1897.			July 6..... 405
Jan.	2.....	2,490	" 12..... 380
"	9.....	1,030	" 20..... 175
"	16.....	595	" 26..... 440
"	23.....	1,010	Aug. 10..... 290
Feb.	3.....	2,165	" 18..... 260
"	9.....	2,030	" 24..... 295
"	18.....	795	" 31..... 495
"	26.....	740	Sept. 8..... 325
Mar.	8.....	2,510	" 13..... 320
"	15.....	21,715	" 28..... 295
"	24.....	6,655	Oct. 4..... 280
"	30.....	3,975	" 11..... 375
April	6.....	1,750	" 18..... 325
"	13.....	5,200	" 25..... 395
"	20.....	3,608	
"	26.....	1,276	

<i>Monthly Averages.</i>				
	1896-7.	1895-6.	1894-5.	1893-4.
November	2,021	977	1,840	420
December	4,415	1,788	5,255	2,050
January	1,281	1,717	2,036	5,235
February	1,432	3,851	785	7,196
March	8,716	5,058	5,852	5,172
April	2,947	8,469	8,983	2,353
May	1,178	651	422	1,172
June	327	251	495	270
July	350	329	542	236
August	335	360	326	206
September	313	292	1,758	310
October	344	406	1,360	342
Monthly average...	1,980	2,012	2,470	2,080

<i>Averages by Seasons.</i>				
	1896-7.	1895-6.	1894-5.	1893-4.
October, November, December	2,280	1,402	2,477	996
January, February, March	3,809	3,542	2,897	5,867
April, May, June	1,484	3,123	3,300	1,256
July, August, September	332	327	633	250
Quarterly averages .	1,976	2,098	2,326	2,096

The usual result of the turnover of the water at the commencement of winter was realized last season, in November, when the monthly average rose from 406 to 2,021 colonies. It was also at this season that the winter bacteria made their appearance, and a considerable proportion of the increase is due to this cause. The breaking up of the Bay ice by the Don floods in the middle of March, nearly a month earlier than 1896, occasioned the rise from 2,510 colonies, on March 8th, to 21,715 on the 15th. The influence of the spring freshets lasted until the early part of May, when the water assumed its normal seasonal character, the number of colonies falling to 415.

The Lake Level.

The past year, like many of its continuous predecessors, may be classed as one of low water. In 1895 the lake level was lower than ever before recorded, and 1896 came in for a second place, though

with a maximum four inches higher. The past year shows the continuance of a rise, the maximum being reached on July 28th, when the water was fifteen inches above zero, or sixteen inches higher than the maximum of 1895, and twelve inches above that of 1896. The minimum for last year was reached on January 26th, when the level was $19\frac{1}{2}$ inches below zero, almost touching the lowest point for the previous year.

All data as to lake levels refer to the Water Works gauge, which, as formerly explained, does not correspond with that of the Harbor Master, but registers about $4\frac{3}{4}$ in. higher.

In last year's report the figures were given to the close of October, when the level was $10\frac{1}{2}$ below zero. The records at the close of each succeeding month are appended :

1896.		1897.	
November	10 in. below.	May	$8\frac{1}{2}$ in. above.
December	$12\frac{1}{2}$ " "	June	$8\frac{1}{2}$ " "
1897.			
January	$15\frac{1}{2}$ " "	July	$9\frac{1}{2}$ " "
February	$11\frac{1}{2}$ " "	August	$4\frac{1}{2}$ " "
March	$1\frac{1}{4}$ " "	September	2 in. below.
April	5 in. above.	October	$5\frac{1}{4}$ " "

The level, at this time, October 31st, is therefore $5\frac{1}{4}$ in. higher than at a corresponding period in 1896, and $14\frac{1}{4}$ in. above that of 1895.

Temperature of the Tap Water.

The result of observations on the temperature of the tap water when the weekly sample is taken, show the range to be from 1 deg. C. (34 deg. F.) in late winter, to 20 deg. C. (68 deg. F.) in midsummer. The latter temperature may be taken as being unprecedentedly high, as far as recorded. On September 16th, 1896, the water was so warm (64 deg. F.) that it gave rise to suspicion of a break in that part of the conduit which crosses the bay, but, as shown in last report, this high degree was not without parallel, nor did it indicate contamination of the supply. The temperature, this year, rose even higher, touching 68 deg. F. on July 28th, and reaching 65 deg. F. on September 3rd.

The conditions giving rise to these extreme figures appear to be a high air temperature, combined with south-easterly winds of sufficient force to drive the warm superficial stratum of water inshore, and

there mix it to considerable depths, or produce deep undercurrents. In 1893 I reported the effect of conditions of this kind, when there was only a difference of 2 degrees between the water at the surface of the Lake and that at a depth of 155 feet. The temperatures were, respectively, 60 deg. and 58 deg., and it was only at 168 feet that the stratum of cold water was reached which is usually found at depths of 50 feet and over.

The average temperatures, by months, are given below, together with those of 1894 and 1895 :

	1896-7	1895-6	1894-5		1896-7	1895-6	1894-5
Nov	42.8	42.6	44.4	May	43.8	44.0	42.9
Dec	38.8	38.1	39.9	June	44.4	48.2	44.0
1897.							
Jan	36.8	36.1	36.1	July	54.6	47.8	48.3
Feb	33.8	33.8	36.5	Aug	49.8	48.0	48.2
March	36.5	33.8	36.5	Sept.....	54.3	51.6	.....
April.....	39.0	37.9	37.4	Oct.....	51.3	47.3	.....

The most noticeable feature revealed by a comparison of the above averages is the high temperature of the last four months, and especially of July, September and October. This is, however, quite in accord with the air temperatures and the continuance of mild weather until late autumn.

Condition of the Conduit.

There has been nothing to indicate any change in the condition of the conduit, and the bacteriological examinations give assurance that there have not been any further leaks. The results indeed show that when the year's water supply is compared with that of former seasons there is evident a slight improvement. Thus the monthly average of bacteria was 1,980 colonies, against 2,012 for the previous year, and 2,470 for 1895, and 2,080 for 1894. The same conclusion may be formed from the averages by seasons, as calculated from the totals of each year, which, for 1896-7, were 1,976 ; 1895-6, 2,098 ; 1894-5, 2,326 ; 1893-4, 2,096. This improvement is probably due to the filling over the conduit, and to some extent to the settling basin on the Island. As remarked in last report, a further improvement may be looked for on the completion of the long-delayed steel section from the Island to the intake.

ICE LOCALITIES.

LABORATORY,

Toronto, November 27, 1896.

Charles Sheard, Esq., M D., Medical Health Officer, Toronto:

SIR,—In accordance with your instructions I visited Ashbridge's Bay on November 20th, for the purpose of taking samples of water for analysis and inspecting the general condition of the locality, more especially with reference to the future cutting of ice for cooling purposes.

The wind was light, and from the north-west, which had the effect of producing a current from Toronto Bay through the new canal, but on passing through to the eastern channel into Ashbridge's Bay I found a current setting in strongly from the south, though the wind had not in the meantime changed in direction. This apparently curious condition was doubtless due to the fact that the lake level had been suddenly raised, possibly by easterly winds in the lower part of the lake, and the water thus forced up was passing by opposite channels into Ashbridge's Bay. Both currents could not be accounted for by the light wind which locally prevailed.

The level of the water by the Harbor Master's gauge was $15\frac{1}{2}$ inches below zero, or seven inches higher than on my visit in November a year ago. The soundings taken correspond fairly well with this increase in depth. In this connection I may point out the fact that, judging from the records of former years, it would be possible for the water in Ashbridge's Bay, in November, to be thirty-three inches above the level observed at the time of my last visit. This would have the effect of greatly enlarging the area of the Bay, and by submergence of the sandbar, materially changing the contour of the land. There is also foundation for the statement that, in the early summer of at least one year, 1870, the water had been $62\frac{1}{2}$ inches above its present level, thus bringing up the general depth to nine or ten feet.

The stations visited were as follows:

- | | |
|---|----------------------|
| Station 1. In line with Coleman's house and lake channel. Middle of Bay ; 875 ft. from shore. Depth 4 ft. 9 in. Sample 3 ft | 15,695 cols. per cc. |
| Station 2. South of Coleman's icehouse, and middle of Bay. Depth 5 ft. | |
| Station 3. South of Laing St. and middle of Bay. Depth 4 ft. 3 in. Sample 3 ft. | 16,240 " |

Station 4. South of Leslie St. and middle of Bay; 1,250 ft. from shore. Depth 3 ft. Sample 2 ft.....	95,590 cols. per cc.
Station 5. North of 7th house counting from east on sandbar, middle of Bay. Depth 2 ft. 3 in. Sample 1 ft. 3 in.	216,000 “
Station 6. Canal, 50 ft. west of Leslie St. Depth 5 ft. 3 in. Sample 4 ft. 3 in.	220,000 “
Station 7. Canal at Morse St. Depth 7 ft. Sample 6 ft.....	liquefied.
Station 8. Laboratory tap	1,865

In my report of a year ago I pointed out the fact that the water of Toronto Bay passed through the canal, and thus extended as far as Lake Street. A similar state of things still prevails, but there is evidence of an encroachment still further to the east.

The area available for cutting cooling ice is bounded as follows : Southerly, from the intersection of Laing Street with the Bay, and in line with the continuation of that street ; thence easterly to the western bank of the new cut ; thence westerly to the place of beginning. The area inclosed by these boundaries is about fifty acres, and the depth will range from four to five feet.

I have the honor to be, Sir,

Your obedient servant,

E. B. SHUTTLEWORTH.

REPORT ON BACTERIOLOGICAL WORK IN CONNECTION WITH DIPHTHERIA.

The admission and discharge of patients in the Isolation Hospital have during the past year been governed by bacteriological methods, as commenced in February, 1895, and since continued. Up to June 30th last, the number of primary cultures made from exudates taken at the Hospital was 1,095, with 797 from outside city patients. Secondary or progress cultures from the Hospital numbered 1,248, with 224 from city patients, making a total of 3,344 examinations to the date mentioned.

The number of primary cultures made from exudates from Hospital patients during the year commencing July 1st, 1896, and terminating on June 30th, 1897, was 543, of which a number were from the throats of scarlet fever patients, regarding whom there was a sus-

picion of diphtheria. The number of progress cultures made from the same source was 684. There were also examined 555 primary cultures and progress cultures from the patients of city physicians.

Comparison of the Results of Clinical and Bacteriological Diagnosis. The actual number of patients sent in to the Hospital during the year for diphtheria, as diagnosed by clinical signs, was 409. The specific bacillus was found to be present in 319 cases, leaving a difference of ninety cases, which, with the exception of two cases of membranous croup, were accepted as being non-diphtheritic, and, on confirmation of this character by second culture, were at once discharged, or treated until convalescence occurred, which was seldom deferred beyond a week.

These negative cases, not including those of croup, amounted to 21.62 per cent. of the whole. In other words clinical diagnosis corresponded with that made by culture examination in 78.38 per cent. of the cases. This is a less proportion than that of last year, when it was 87.6, and is somewhat larger than that for the five months preceding the latter, when it only reached 75.5 per cent. These results may be tabulated as follows :

	Cases.	Positive.	Negative.
5 months, February, 1895, to July, 1895	188	75.5	24.5
12 " July, 1895, to July, 1896....	377	87.6	12.4
12 " July, 1896, to July, 1897....	409	78.4	21.6
Average for 29 months (974 cases)...		81.3	18.7

The differences between the percentages of negative cases in the above periods are to some extent due to variations in the prevalence of tonsillitis, and also to the fact that the results of the first examinations had the effect of preventing physicians from sending to the Hospital those cases in which clinical diagnosis was uncertain, and thus the percentage of negative cases was reduced during the second period. The feeling of hesitancy thus engendered has happily been replaced by a free resort to, and reliance in bacteriological diagnosis, and a recognition of the fallibility of the clinical method, no matter by whom, or how skilfully made. The figures given are probably sufficient to warrant the conclusion that the average clinical diagnosis is correct in four out of five cases.

The proportion of positive to negative cases in the exudates sent to the laboratory by the city physicians is much less than with those from Hospital cases, as the outside cases are often only clinically

diagnosed as suspicious. The figures for the entire period are appended :

	Cases.	Positive.	Negative.
5 months, February, 1895, to July, 1895	60	61.7	38.3
12 " July, 1895, to July, 1896....	182	56.6	43.4
12 " July, 1896, " 1897....	555	40.9	59.1
Average for 29 months (797 cases)..		46.9	53.1

The proportion of positive to negative cases has decreased steadily throughout the period, showing the greater popularity of the method. This has been repeatedly confirmed by city practitioners, who have stated that they send exudates for diagnosis when there is the slightest suspicion of diphtheritic infection. The increase of the number of swabs sent in—from 182 in 1896 to 555 in 1897—adds weight to this view, and is also gratifying evidence of the utility of bacteriological diagnosis.

Persistence of Bacilli in the Throats of Patients. The statistics obtained in regard to Hospital discharge throw considerable light on the duration of the life of the bacillus, shortened as it doubtless is by the result of the efforts to improve the general health and consequent resistance of patients, and possibly by the more direct but perhaps not more effective attempts which are vigorously made for the destruction of the micro-organism by disinfectants.

The duration of the Hospital term does not, of course, quite correspond with that of the continuance of the disease, as it is not always that the patient is admitted immediately after the discovery of the character of the attack. It might probably be assumed that a few days generally so elapse. Allowance for this can be made by dividing the Hospital term into weekly periods, by which the actual time spent in the institution is over-stated, but the duration of disease more nearly approximated. Thus, a patient who has been in the Hospital for any number of days under seven, or a multiple of seven, is credited with the full period.

The duration of clinically diagnosed diphtheria, as thus calculated in 352 non-fatal cases, is shown by the following percentages :

7 days. %	14 days. %	21 days. %	28 days. %	35 days. %	42 days. %	Over 42 days. %
22.72	11.36	23.86	23.01	18.35	2.55	3.12

The cases of over 42 days' duration were 11 in number, and continued respectively for 45, 46, 46, 47, 49, 50, 53, 54, 65, 66 and 77

days. The last case was that of a young woman of 18 years of age, in whom the tonsils, pharynx and larynx were involved. The infection was mixed, streptococci and yeast being present. The latter persisted for 58 days, the diphtheria bacillus for 76 days, and the streptococci to the close. This case was a parallel to that which was recorded last year, in which the infection continued 75 days.

Though these prolonged cases are very wearying to the Hospital authorities, as well as the bacteriologist, there is some consolation in the fact that the bacillus may disappear in a very short time. During the year these brief cases comprised the following terms: 1 of 4 days; 2 of 5 days each; 2 of 6 days; 2 of 8 days; and 5 of 9 days. All these were mild tonsillar cases, and all with the exception of one—that of a boy of ten—were patients of over fifteen years of age, the majority, including the case of shortest duration, being over twenty. There can be no question that these brief cases were those of true diphtheria, as demonstrated by bacilli of well marked microscopical characters; capable of forming membrane, and of producing other clinical signs of the disease. These instances show that a true diphtheritic infection in adults may terminate clinically and bacteriologically within a week, or in even a shorter time.

Duration of Hospital Term. This subject is closely related to the preceding, but, as previously explained, the continuance of the disease is almost always necessarily greater than the Hospital term. Of the 352 non-fatal cases admitted as being real or suspected diphtheria, the total detention was 7,121 days, or an average of 20.23 days per case.

When this average is compared with those of former years it is found to be 5.9 days shorter than in 1893 and 1894, when Hospital discharge was altogether determined by clinical signs, and the expiry of 14 days after the disappearance of the membrane. It is also less than the average for 1895, and part of 1896, when discharge was decided bacteriologically. The term for that period was 22.8 days, showing for last year a saving of 2.6 days. This is mainly attributable to the fact that when the examination of the culture shows a recently admitted case to be non-diphtheritic a fresh culture for confirmatory purposes is at once made, while formerly this was deferred until the succeeding day. In the case of the second culture giving a negative result the patient is at once discharged. Swabs are also now taken more frequently than formerly, often twice a week, and sometimes at shorter intervals. This doubtless has its effect in shortening the

term, and it is not improbable that the type of disease was somewhat milder, as is borne out by the mortality record.

The actual time saved last year over that in a similar number of cases, when the older method was practised, was 2,066 days, or 22.6 per cent. This is a direct gain, but entirely subordinate to the prime object for which microscopical examination was designed—obviation or minimization of the danger of transmission of infection through discharged patients.

Susceptibility as Influenced by Sex. If to the total of 352 non-fatal cases of real or suspected diphtheria there be added 57 in which the disease proved fatal, and 74 mixed cases, the total for the year is found to be 483, of whom 218 were males and 265 females, or 45.1 and 54.9 per cent. The figures last year were 40.8 and 59.2 per cent. respectively. The predominance of female is again apparent, and this is quite in accordance with the Hospital records elsewhere.

In 1,000 cases true diphtheria, as shown in another report herewith submitted, the proportion of males to females was 45.2 to 54.8 per cent., which very closely corresponds with the numbers for real and suspected cases this year.

Hospital Mortality. Of the 483 patients admitted to the diphtheria side of the Hospital there were 79 deaths. This included the mixed cases, and the mortality was thereby considerably raised, equalling 16.35 per cent. Sixteen of these deaths occurred within twenty-four hours of the admission of the patient, and three in less than an hour. It is evident that for the credit of the Hospital these moribund cases should be omitted. This was the expressed opinion of Mr. Lennox Brown, of London, England, with whom I talked over the matter last summer, when he visited Toronto, and is in accordance with practice elsewhere. A correction of this kind brings the mortality down to 13.0 per cent.

In calculating the mortality from the 409 cases which were clinically diagnosed as diphtheria, uncomplicated with scarlet fever, the percentage is only 13.2, the number of deaths being 64. If from these there be deducted the 15 moribund and mixed cases, the mortality is lowered to 10.1 per cent., which justly represents the result of Hospital treatment, and, as such, is comparable with that of other institutions, or methods of cure.

The mortality in the mixed cases was 20.2 per cent. In one of the 15 deaths the patient expired 26 hours after admission; in another, on the third day; and the balance for longer periods, the most lengthy being 45 days.

Susceptibility as Influenced by Age. This subject has been elucidated in the paper referred to, and as the results arrived at were calculated from 1,000 cases of true diphtheria, and include most of those of the year under review, they need not be here repeated.

Mortality as Influenced by Sex. Of the 64 deaths from unmixed diphtheria, 40 or 62.5 per cent. were those of males, and 24 or 37.5 per cent. were of females. The greater mortality among males is again confirmed, and forms a contrast to the greater liability of females to contract the disease, the susceptibility being 54.8 for females, against 45.2 per cent. for males.

In the mixed scarlet fever cases here, the proportion of males to females was as 46.6 to 53.4 respectively, but the number of deaths, 15, is not sufficient to warrant any generalization.

Mortality as Influenced by Age. Of the 64 deaths from diphtheria, uncomplicated with scarlet fever, the proportions as to age were as follows :

Under 5 years	40 deaths or 62.5 per cent.
5 to 10 years	18 " 28.1 "
10 to 15 years.....	2 " 3.1 "
Over 15 years.. ..	4 " 6.2 "

This table may be compared with a similar one compiled from data furnished in Mr. Lennox Brown's record of 1,000 cases, in which there were 283 deaths :

Under 5 years.	181 or 63.9 per cent.
5 to 10 years.....	83 or 32.8 "
10 to 15 years.....	12 or 4.2 "
Over 15 years.....	7 or 2.4 "

Association of Diphtheria and Scarlet Fever. The apparently simultaneous occurrence of diphtheria and scarlet fever in the same patients was noticed here for the first time during the past year. There were in all 74 cases of this mixed character, many of which were in this condition when admitted to the Hospital. The disease proved, as elsewhere, more serious than with either of the separate infections, and in the statistics of hospital detention and those relating to the duration of diphtheria, these cases were necessarily omitted on account of the lengthy period of convalescence allotted to scarlet fever, after the disappearance of diphtheritic infection. The mortality of these cases was also higher than with either of the separate diseases.

Organisms Present in Cultures. The practice of roughly noting the character of organisms found on the first examination of cultures, after 24 hours' incubation, has been continued, and the record is complete for 365 cases. It is likely, as previously stated, that after the lapse of 24 hours some organisms of slow growth would develop, but I do not think this is true for the diphtheria bacillus nor streptococcus pyogenes, and, as far as staphylococcus pyogenes aureus is concerned, its presence was noticed at the time, and also confirmed by a microscopic examination of the tubes at the close of each week.

Yeasts were found to develop in 72 cases, or nearly 20 per cent. of the cultures.

The average of two years' observations is given for comparison :

Organisms Present.	Last Year.	Average of 2 years.
B. Diphtheria	42.1	49.0
" and Streptococci	22.7	19.8
" and Staphylococci	6.0	6.5
" Streptococci and Staphylococci	6.7	7.0
Staphylococci only	1.3	3.6
Streptococci only	11.2	6.6
Staphylococci and Streptococci	4.6	2.3
Other Organisms	6.0	...

Organisms Compared with Clinical Results in 358 Cases during 1897.

Organisms Present.	Mild.		Severe.		Very Severe.		Fatal.		Total.	
	Cases.	%	Cases.	%	Cases.	%	Cases.	%	Cases.	%
B. D. only	78	50.6	13	8.3	23	14.9	40	25.9	154	43.0
“ & Strep.	56	67.4	5	6.0	13	15.6	19	22.9	83	23.1
“ & Staph.	5	23.8	2	9.5	6	28.5	8	38.1	21	5.8
“ St. & Sp.	9	40.9	2	9.0	..	..	11	50.0	22	6.1
Staphylococci.	5	100.0	..	..	..	..	..	..	5	1.4
Streptococci ..	41	100.0	..	..	..	..	..	..	41	11.4
Staph. & Strep.	17	100.0	..	..	..	..	..	..	17	4.7
Other org'isms	14	9.3	..	..	..	..	1	6.6	15	4.1

The above table may require a little explanation. Thus, taking the column of “Organisms Present,” and following out the percentages relating to “B. D. only,” it is shown that of the total cases (154, or 43.0 per cent. of 358), in which B. Diphtheriæ was the sole organism, 50.6 per cent. resulted in a mild type of disease; 8.3 severe; 14.9 very severe; and 25.9 fatal.

The following table is constructed in a similar way, but covers three years, thus furnishing averages based on larger figures, and which, though still insufficient for complete acceptance, may afford some indication of the influence of the co-existence of micro-organisms.

ORGANISMS IN CULTURES COMPARED WITH CHEMICAL RESULTS, 1895-6-7 WITH AVERAGES,

[illegible]

OBSERVATIONS ON THE ETIOLOGY OF DIPHTHERIA.

BY E. B. SHUTTLEWORTH, F.C.S.

Read at the Montreal Meeting of the British Medical Association and published in the British Medical Journal.

The following notes are, in part, derived from a study of the diphtheria statistics of Toronto for the past nine years, but are more particularly the result of bacteriological work done in connection with the Isolation Hospital, or in the diagnosis of cases of diphtheria reported to the Health Department since the beginning of 1895. The admission and discharge of hospital patients, in the institution named, is entirely governed by the results of exudate culture and examination. A bacteriological record of the character, course and termination of the disease is thus available for comparison with that furnished by clinical history. The number of such cases up to July last, is 1,277, while of outside patients, of whom clinical details are incomplete, there have been 797, making in all, 2,074 cases, a total sufficiently large to warrant an attempt at generalization, at least as far as relates to the manifestation of the disease in a Canadian city.

Although the diphtheria bacillus may be accepted as the chief and indispensable factor in the production of the disease, it is less powerful than are some pathogenic micro-organisms, and more dependent on those favorable conditions for complete development which are generally styled predisposing causes. The bacillus of Frankel, which is to be found in the mouth secretions of fifteen to twenty per cent. of ordinary individuals, and yet so seldom finds an opportunity for the development of pneumonia, may be instanced as an organism most largely dependent on its environment, while Neisser's diplococcus, always virulent in man, may be cited as the other extreme. Loeffler's bacillus appears to occupy an intermediate place, for while under favorable circumstances it is capable of the most luxuriant growth, and the utmost toxic power, in other instances, as in the direct implantation experiments of Trousseau and others, it failed to produce any of the symptoms of the disease, and, like the pneumococcus, may live and thrive with little or no injury to its host.

Its occasional existence, in apparently healthy throats, has been noted by many observers. Its persistence under such circumstances is sometimes very remarkable, as in the case of a boy from whose tonsils I made many cultures during the course of sixty-four days. The characters of the bacillus were very marked, and its virulence, as tested on guinea pigs, was also well pronounced. The patient had

been exposed to infection, and his throat was slightly congested giving rise to a suspicion of diphtheria, but, for the greater part of the time, was normal in appearance and quite free from the enlarged and honeycombed tonsils which so often serve as the lurking places for bacilli.

The condition of this boy was one of receptivity towards the germ, but of resistance to its effects. He was undoubtedly the subject of diphtheritic infection, possessing fatal power as tested on animals, and thus presumably capable of communicating the disease to human beings, while he did not suffer from it, or only at first to a very slight degree. It is difficult to classify these cases, but it would probably be more correct to say that they are affected by diphtheria than that they are not. They are, at least, infected persons, capable of disseminating disease, and from the standpoint of the Health Officer should be so regarded.

Another class, happily the great majority, appear to enjoy entire immunity, though exposure may be of the most trying character. Patients suffering from pure tonsillitis, who by a wrong diagnosis are frequently placed in the wards of isolation hospitals, are exposed to infection or contagion, but comparatively seldom pay the penalty. The presence of morbid material is here subordinate to the conditions for its development, at least as far as the actual production of disease. There is a want of receptivity, if not an actual resistance, which bars the growth of the bacillus, and the soil thus becomes of more importance than the seed.

This leads me to reverse the mode in which the subject is usually presented, so that it may be examined in a different light and from another standpoint. I shall therefore briefly refer to a few of these modifying conditions, and at the same time offer some facts which will serve to determine the character of the disease existing in this locality.

Age. This most important predisponent may be estimated either from frequency of occurrence or resulting fatality. As most statistics of the kind are based on mortality only, or refer to cases reported as diphtheria and not confirmed by bacteriological test, I have tabulated 1,000 cases of true diphtheria, so as to obtain data by which age disposition and age mortality may for the time and place be established, and an opportunity be thus afforded of comparing the results with those of the 1,000 cases given by Lennox Browne in England, and with the statistics of the Asylums' Board Hospitals.

Occurrence of Diphtheria at Various Ages (Per Cent).

	Toronto.	Lennox Browne.	Asylum Board Hospitals.
	1,000 cases.	1,000 cases.	1892-3.
Under 5	35.4	40.3	37.4
5 to 10	33.4	31.7	31.1
10 to 15	11.3	10.2	10.4
Over 15	19.9	17.8	21.1

Mortality of Diphtheria at Various Ages (Per Cent.)

	Toronto.	Lennox Browne.	Asylum Board Hospitals.
Under 5	34.1	45.2	52.6
5 to 10	13.9	22.3	25.4
10 to 15	6.0	10.3	8.8
Over 15	11.1	4.4	5.0

The figures of Lennox Browne refer to true diphtheria, and those of the Asylums' Hospitals to ordinary cases, as admitted, but the numbers are fairly consistent throughout. The mortality table shows, however, that in Toronto the disease is much less fatal to children under five years of age than in London. This feature is more strongly marked for the period between five and ten years, and also from ten to fifteen, but, for ages over fifteen, the death rate is twice as high in Toronto. The general conclusion may be formed that diphtheria here is less severe during infancy, childhood, and early youth, and more fatal during and after adolescence. The mortality observed for true diphtheria is 17.8 per cent.

Sex. Liability to attack has been generally recognized as being greater in the case of females than males. This is in accordance with the Asylums' Board statistics of 11,598 cases, which show the ratio to be 54.8 to 45.2 per cent. Of the 1,000 cases of true diphtheria here, the proportion is precisely the same. The predominance of male births over females, in Toronto, is however usually as 105 to 100, so female susceptibility is really rather greater than that stated, and may be roundly taken at 10 per cent. over that of males. This is probably to be accounted for by increased exposure, due to the amusements of female children, which are generally of an indoor kind, involving close personal contact and association with companions or playthings which may be infected. Mothers and girls, acting in the capacity of nurse, are also more liable to seizure than males of the same ages, and this fact has an observed effect on the statistics of age predisposition above given.

Season. Although an epidemic of diphtheria may occur at any season of the year, the disease nearly always manifests itself, in the most marked degree, during the winter months. Mortality statistics cannot be taken as correctly indicating frequency of occurrence, but afford some guide. The 18,698 fatal New York cases cited by Dillington, show October and the five succeeding months to furnish by far the greater number, with the maximum in December. A similar state of things exists in Canada. The diphtheria statistics of Toronto, for the last ten years, include 6,622 reported cases, in which the maximum was reached six times in December, thrice in November, and once in January, with the minima in August (4), May (3), July (2), and April (1). In 1891 there were only 18 cases in April, but 246 in November.

The average humidity of Toronto for the winter months—October to March—is 80.5 per month, and for the balance of the year 72.6, while the total precipitation, as rain or snow, is 2.80 and 2.92 inches, respectively. The connection between prevalence of diphtheria and humidity appears to be close, and there is probably such relation, but that this depends on the atmospheric conditions being favorable to fungoid growth is open to question, at least in this country, in which the winter temperature is so low as to quite inhibit bacterial growth, while for the time that the disease is most frequent the ground is more or less covered with snow. It seems probable that conditions which affect the individual rather than the micro-organism are not without their influence. Of these may be mentioned the lowering of resistance through the depressing effects of cold; the confined atmosphere of living rooms, which is often contaminated with the gases escaping from furnaces and stoves, and the substitution of indoor for outdoor recreation.

Drainage, Soil and Elevation. In order to study the possible connection between drainage and diphtheria, the 3,714 cases reported during the past five years have been classified by streets and sewer areas, and in many districts have also been plotted. It may be explained that the land on which the City is built rises gradually from Lake Ontario until it reaches an elevation of 170 feet. There is an underlying stratum of stiff clay throughout, with loamy superficial soil, becoming sandy on the higher ground.

Soil, and subsoil, appear to have little influence, and natural elevation is so involved and complicated with others conditions, particularly as to drainage, that it is extremely difficult to arrive at definite conclusions with regard to this matter. It may, however, be

said that the disease shows a preference for the higher ground, and that some sewer areas suffer more than others, possibly dependent on the greater fall, and consequent upward air current in the main conduits. I do not intend to convey the impression that the bacillus is or can be conveyed by ordinary moist sewer gas passing through defective plumbing into the houses, but such emanations, though not directly infective, are capable of lowering vital power, and diminishing resistance to disease.

Comparatively little of the City is unsewered, and there is not much opportunity of comparing such parts with those in which the system is complete, but, so far as observed, they are not in this respect at a disadvantage.

In this connection, I may say that on short "blind" streets, the disease shows a greater tendency to indemicity than on those which are truly thoroughfares. This might be attributed to confined and imperfect circulation of air, and such has doubtless its effect. I am, however, inclined to the opinion, that it is mainly due to the fact that these streets are generally sheltered and retired, with little interruption from pedestrians, vehicles, and perhaps policemen, so that they become favorite playgrounds for children, and thus suitable for disseminating disease. It is seldom that a solitary case so continues.

Pavements. Although, as far as I know, the literature of diphtheria does not contain any reference to pavements, the subject is of considerable interest in Canada, as many persons hold the opinion that the so-called cedar block roadway exerts a powerful influence in producing the disease. Articles unfavorable to this pavement are frequently to be seen in the daily papers, but I may state, that a careful comparison of the frequency of occurrence of diphtheria on streets and districts paved with cedar blocks, macadam and asphalt, does not show this widespread belief to be founded on fact.

Equal lengths of streets, and areas, in similar localities, and as nearly as possible with an equal density of population, but with different pavements, have been compared as to the number of diphtheria cases reported during five years. More than forty miles of streets have been thus gone over, with the result of proving that between cedar block and macadam there is practically very little difference in this respect, the totals only showing 1.7 per cent. in favor of macadam and unimproved roadways. Asphalted streets appear to be slightly freer from diphtheria, but from the data collected it does not appear that the character of the pavement is a factor of much importance.

Infected Houses. The duration of life of the diphtheria bacillus has been very variously stated, and this may doubtless be explained by the circumstances of the observation or experiment. Roux and Yersin found diphtheria membrane to retain its virulence for 140 days, Park for 119 and Loeffler for 198, while Abel reports an experiment in which an infected toy remained so for five months. There may, however, be natural conditions which admit of a greater longevity. The recurrence of disease in houses leads one to think that this may be the case. During the past five years I find that in 185 instances the disease has occurred twice in the same house, and thrice in 13 cases. In three of the latter it has again appeared since January last, showing four attacks in five and one-half years.

It may be said that disinfection by sulphur dioxide, and washing with 1-1,000 solution of mercuric chloride has been carried out as faithfully and perfectly as practicable, and in many of the houses the hygienic conditions seem perfect. It is difficult to believe that these recurrences are the result of mere chance, and there is an apparent foundation for the opinion that, under unknown conditions, the bacillus may survive from year to year. If this is not the case the only recourse is the supposition that there may be a continuance of non-hygienic predisponents, but, as before stated, this will not hold good generally. In the smaller houses an attack of diphtheria generally leads to a change of tenancy, and family predisposition cannot be accepted as explaining those recurrent attacks.

Constitutional Predisposition. Much evidence might, if necessary, be added to that already accumulated to show that family and individual susceptibility are factors of the utmost importance. Some families enjoy entire immunity, while others, in like circumstances, at once succumb to infection, and often with fatal results. The most prominent instance on the books of the Isolation Hospital is that of a mother and eight children, who, at the same time, were inmates of the institution. Many other cases of entire or large families of children, with one parent, oftenest the mother, might be cited. Such patients are liable to subsequent attacks, sometimes twice in one year, though proved free from the bacillus when discharged. The bacteriologist who remembers the names of his clientele, comes to regard these non-resistant families as does the detective those whose moral stamina is of a like character.

Mouth breathing, due to obstruction of the naso-pharyngeal passages, from enlargement of the faucial tonsils, and hypertrophy of Luschka's tonsil, is given by Lennox Browne as the principal cause of

this predisposition, and this explanation seems satisfactory. The "open wound" of Virchow becomes even more expressed when the tonsils are in an abnormal state, such as appears so frequently in those who become the subjects of diphtheria. Over fifty per cent. of the patients in the Isolation Hospital show pronounced adenoid vegetations.

Faucial Bacilli. Bacteriological examinations of cultures of the secretions from healthy throats generally reveal the presence of streptococci, and the reappearance of such bacteria, after an attack of diphtheria, almost invariably heralds the termination of the disease. *Staphylococcus pyogenes aureus* occasionally accompanies and survives the specific organism, but streptococci, of one or more species, are almost constantly present at the close. It may be that these cocci, or their products, exercise a benign influence, not only of a protective kind, but of a curative character, and I may incidentally say that I am now engaged in experiments with a view of determining the latter point.

It is not impossible that one of the organisms which figures under the Protean title of *streptococcus pyogenes* may directly or through the products of vital action be antagonistic to *B. diphtheriæ*. That there is some prophylactic influence of the kind seems to be indicated by the following facts: Patients sent to the Isolation Hospital for diphtheria are, for want of suspect wards, nearly always put in rooms with those suffering from the disease, and until bacteriological examination is made, are there retained. If culture of the exudate, taken on admission, shows only streptococci, or staphylococci, or both, and the patient is not seriously ill, he is at once discharged. If the clinical signs are bad, a second swab is taken, and, exceptionally, a third. If the diphtheria bacillus is still absent, the patient is no longer considered as being a fit inmate for a hospital for contagious disease, and is sent home, or to some other institution. These non-diphtheritic cases which are merely tonsillitic, or similar inflammatory affection, remain side by side with diphtheria patients, and are attended by diphtheria nurses, for periods ranging from two to seven days. Of 172 patients of this kind who were admitted to the hospital, not one contracted diphtheria, either in the institution or afterwards, so far as known. It does not seem likely that the same number of healthy persons would have thus escaped.

Tonsillitis is generally stated to be a predisponent, but the fact above stated certainly does not confirm this, at least as far as relates to the disease in its acute stage. The evidence seems, indeed, suffi-

cient to warrant the claim that the condition of the patient renders him in some way immune to diphtheria. It would, perhaps, be going too far to attribute this to the presence of streptococci, which, either alone or with staphylococci, are characteristic of tonsillitis; but such conclusion seems to have some foundation.

When streptococci and staphylococci are together associated with the Loeffler bacillus, the resulting disease is of a less malignant character than when the latter organism is alone present. This was pointed out by me in 1895,* when it was shown that with such mixed bacteria the mortality was 14.2 per cent., against 19.3 per cent. when the Loeffler bacillus was the sole cause of infection. This was confirmed in 1896,† when the death rate was even lower, and the proportion of mild cases, in the pure and mixed infection, were respectively 47.9 and 60.0 per cent. This proves the modifying effect of a mixture of micro-organisms, and lends some force to the supposition previously advanced.

I regret that the time limit set for this paper will not permit me to allude to other predisponents or to make any reference to the direct cause of infection. I should, however, like to emphasize the fact that it is to the persistency of bacilli in the throats of convalescents that the transmission of the disease is largely attributable.

The examination of exudates during last year showed the average duration of the disease to be 22.8 days. In 13.9 per cent. the bacillus was present from 28 to 35 days; 5.9 per cent. between 35 and 42 days; 2.1 per cent. between 42 and 49 days; while in one instance the infection was retained until the 65th day, and another until the 75th day. Under ordinary circumstances most of these prolonged cases would have been pronounced clinically well and fit to associate with other persons, with a result which need not be pointed out.

TORONTO, August 25th, 1897.

* London Lancet, September, 1895.

† Report of Toronto Board of Health, 1896.

THE RELATION BETWEEN SCARLET FEVER AND MILK.

Read at the Annual Meeting of the Executive Health Officers of Ontario.

The communicability of scarlet fever, through the medium of cows' milk, may be regarded as established beyond the shadow of a doubt. Much attention has been given to the subject during the past fifteen years, and a large number of instances have been brought forward in which the connection between milk and disease has been positively demonstrated.

The most notable of these cases is the Hendon outbreak, which occurred in 1885, not only at Hendon, where the implicated dairy farm was located, but in three districts in North London where milk from this dairy was distributed. This outbreak is particularly prominent from the fact that it was made a special subject of investigation and study by Mr. W. H. Power, F.R.S., in which he was assisted by Dr. Klein, both of whom reported to the Local Government Board. The precise number of cases of scarlet fever directly traceable to the milk supply is not given, but in general terms is stated as "a strikingly large proportion."

Another outbreak occurred at Wimbledon and Merton in the winter of 1886. This was also investigated by Mr. Power, and out of 545 cases of scarlet fever, in the districts named, 493, or 90.5 per cent. were consumers of the suspected milk. An attack at Glasgow, in the summer of 1892, gave a proportion even greater than this, as of 236 cases, all were traced to the milk of one dairy.

In a recent series of articles in the British Medical Journal, on the influence of milk in spreading zymotic disease, Dr. Ernest Hart gives an abstract of thirty-two similar instances, of which authentic records exist, thus affording proof, if such is indeed required, that there is an intimate relation between scarlet fever and milk.

The nature of this relationship is by no means as definitely made out. In the historical Hendon outbreak, the researches of Mr. Power go to show that the milk had not become infected in any commonly accepted way, such as unwholesome conditions of water or drainage, or by careless handling of milk, or milk utensils by infected persons, but through the cows themselves. About a fortnight before the outbreak of scarlet fever occurred, three newly-calved cows were purchased and added to the herd, which numbered about one hundred. Subsequent investigation revealed the fact that at least one of these additions was suffering from vesicles and ulcers on the teats and udder, and that the affection had spread to other animals in

the shed from which the infected milk was obtained. The withdrawal of this milk from distribution was followed by a cessation of scarlet fever, but a small quantity, which was surreptitiously entered into consumption, gave rise to the disease in a large proportion of the families to whom the milk had been delivered.

Dr. Klein's examination of the affected animals showed that on the teats, and sometimes on the udders, there were flat, irregular ulcers, from one-quarter to three-quarters of an inch in diameter, first appearing as small vesicles on a greatly swollen and red surface, and later covered with a brownish crust, which, when scraped away, left a granulating, slightly indurated base, not elevated, nor surrounded with any redness of the skin. Patches, denuded of hair, were noticed on some animals, and the epidermis was rough and scaly, as in desquamation. Two animals were removed for special observation, and were subsequently killed. The lungs exhibited numerous lobules, and great congestion; there were also pleural adhesions; and, in one case, the cortex of the kidney was congested, but its medulla was pale.

Inoculations in calves, with the matter from the ulcers, produced similar lesions, and sometimes death. A streptococcus was isolated from the original contents of the ulcers; from those produced by inoculation, and also from the blood of the inoculated animals. This micro-organism was claimed by Dr. Klein to be identical with the streptococcus found in human scarlet fever, and by its biological characters to be capable of differentiation from *Streptococcus Pyogenes*.

The streptococcus was not satisfactorily demonstrated in the milk, as flowing from the udder, but such implantation would likely take place by the manipulation of the ulcerated teat during the act of milking.

I have no desire to raise the question as to the identity of the so-called Hendon disease in cattle, and scarlatina in the human subject, or the micro-organism, or micro-organisms, in which they originate. Suffice it to say that there is much difference of opinion in regard to these matters, and some eminent authorities, including Professor Crookshank, are not inclined to cede the position assumed by Dr. Klein. My object in alluding to these points is simply that of showing the possibilities of the case.

Though the precise character of the *materies morbi* is still a matter of uncertainty, the transmissibility through milk is undeniable.

On analyzing the records of the thirty-two outbreaks collected by Dr. Hart, the exciting causes are shown to be as follows :

1. Existence of scarlet fever infection on the premises or in the families of dairymen or attendants. (17 cases.)
2. Ulcerated teats—possible Hendon disease. (8 cases.)
3. Milk from newly-calved and unclean cows. (2 cases.)
4. Polluted water used for washing containers. (2 cases.)
5. Not ascertained. (2 cases.)
6. Unsanitary byres or dairy. (1 case.)

To this I would add :—

7. Use of unsterilized bottles for distributing milk.

Of late years the practice of serving milk in quart wide-mouthed bottles, closed by a card disc. or other stopper, has become exceeding popular in Toronto, and doubtless elsewhere. Were it not for the possibility of the conveyance of disease, it seems to be the most cleanly and convenient mode of distribution and temporary storage. Filled bottles are, however, taken directly into the rooms of patients suffering from contagious diseases, and are there kept and used as containers until empty. The bottle may then be possibly rinsed out, or is returned unwashed to the milkman, who puts it with others and conveys it back to the dairy.

There is a possibility, if not a strong probability, that a bottle so used may become infected, not only by the hands of the nurse, on its smeared exterior surface, but, by the air-borne particles by which the disease is admittedly conveyed ; and also, that the remains of the milk in the vessel may form a suitable medium for the multiplication of the specific micro-organism. The infected bottle may, by contact with others, contaminate them, and the manipulations of the milkman would also tend to this result.

I can speak from experience in regard to the treatment which dirty bottles receive in the average dairy. They are placed in water as hot as can be borne by the hands—about 45 C. (113 F.)—a little sal soda, pearline, or ordinary soap is added, and the bottle cleaned by a revolving brush. It is then rinsed with water, drained, aired, filled with milk, and sent forth on its mission for weal or woe.

The water used for washing, and the ordinary time of immersion, is not sufficient for sterilization. According to Sternberg the thermal

death point for streptococcus pyogenes is between 52 and 54 C., with ten minutes' exposure, and it is probable that other infecting cocci would require the same treatment. This temperature would be higher than the operator could stand, and the loss, by fracture of the badly annealed bottles, which is so much complained of, would likely be increased so as to interfere materially with the profits of the dairyman.

That scarlet fever infection may be transmitted by bottles seems likely from the outbreak last spring in Toronto, to which extended reference was made in the late report of the Secretary of the Provincial Board of Health, and of which the circumstances may be briefly recounted.

Before doing so it may be well for me to state the position which Toronto occupies with regard to the disease. The records of eleven years, 1886-96, embrace 3,280 reported cases, sometimes falling as low as one case per month, and giving an average of 24 cases per month over the whole period. In the winters of 1891 and 1892, the disease assumed an epidemic character, the average per month for six months being 78 cases. Since January last, and up to July, a more serious outbreak occurred, showing an average of 187 cases per month.

The type of disease may be learned from the records of the Isolation Hospital, but as the cases sent to that institution are usually more severe than those in private practice, the result will probably be higher than if the whole City were included. In 1893 the mortality was 19.25 per cent., declining in 1894 to 16.27 per cent., and 8.19 per cent. in 1895, while of the 55 cases admitted last year there was not a single death. It remains to be seen whether the recent outbreak, with its partly different origin, will not bring about a revival of virulency. The indications so far point in this direction.

It may be further explained that, at the beginning of the year, the milk supply of houses in which scarlet fever occurred was closely watched, and since February 1st a regular record has been kept of particulars relating thereto. The total milk consumption of Toronto amounts to about 12,000 gallons per day, so that, by ascertaining the quantity supplied by each dairyman, his place as a possible carrier of infection can be determined readily.

Nothing unusual occurred until May 17th, when from the customers of one dairy there were reported five cases of scarlet fever. For the first four months of the year this large establishment had an enviable record, only three cases being reported. From May 4th to

16th, inclusive, there were four cases, followed by the large increase mentioned. On the 18th another case occurred, three on the 19th, and two on the 20th, until, by the end of the month, the total for May was thirty-six. The largest number in any one day was reached on June 3rd, when thirteen cases were reported. The last case from this dairy was recorded on June 17th, making forty-five for that month, or eighty-one for the period of forty-five days. The persons affected were residents of various parts of the City, and, as a rule, belonged to the better class.

The milk supplied by this dairy amounted to about two per cent. of that used in the City, and the liability to infection should have followed the same proportion. In April the cases had not reached this limit, being only 0.4 per cent of the whole number affected, but in May the percentage was 16.9, and in June, 25.5 per cent. of all the cases in the City were consumers of this milk. During the first nine days of this month the percentage was 42.4, while the normal proportion should have been less than two per cent.

In view of these facts it is difficult to arrive at any conclusion other than that implicating the milk supply, but an attempt to trace the origin of the infection has not been attended with such definite results.

As the dairy was situated in the country, outside the limits of the jurisdiction of the Health Officer of Toronto, there was some delay in bringing the matter under control. Action was taken on May 20th, and, later on, the Secretary of the Provincial Board, whose aid had been invoked, reported having visited the dairy, and found all the operatives free from scarlet fever. He recommended the sterilization of the rinsing water used for bottles, by heating it to the boiling point.

On May 26th the Health Officer of Toronto, accompanied by the writer, were permitted to inspect the premises, and found that some eighty cows were lodged in a byre of which the sanitary arrangements were in all respects satisfactory. One of the cows was emaciated, and apparently sick, but her milk was said not to have been used for a week previous. None of the animals had ulcerated teats, though many were warty. With the exception specified the cattle were seemingly in prime condition. This had been previously asserted by a competent veterinary inspector, as also subsequently. No scarlatina could be traced among the employees or their families. The milk from all the cows was mixed, cooled and bottled in a house set

apart for the purpose, but the drainage and condition of this shed were not very satisfactory. The bottles received from customers were collected without special precautions, and washed in the usual manner. This operation was sometimes not sufficient to remove all traces of previous use.

A thorough renovation of the milk-house and wash-house was proposed and assented to by the proprietor, who, at all times, was exceedingly willing and anxious to do everything in his power to comply with the suggestions of the Health authorities. The improvements required were, however, somewhat extensive, and did not progress as rapidly as desirable. Temporary expedients were resorted to, but as the efforts made seemed to have no effect in lessening the occurrence of the disease, the Health Officer of Toronto was compelled to call the attention of the proprietor to the only legal remedy, which is specified in section 90 of the Health Act. This was not resorted to, as the milk was voluntarily withheld from distribution, and I believe destroyed, until arrangements were perfected. Since July 6th, when the milk was again sold, there has only been one case (July 21st) of scarlet fever occurring among the customers of this dairy.

Setting aside the emaciated cow, and the imperfect sanitary condition of the milk and wash-houses, there is nothing left to account for the dissemination of the disease except the bottles, which appear to be the most likely cause.

A feature worthy of notice is that relating to the incubative stage of scarlatina communicated through milk. No customer from the dairy received any milk after June 3rd, but there were twenty-three subsequent cases; two of the last of these showed incubative periods of seven and eight days, respectively, after consumption of the milk and up to the commencement of recognizable illness.

Annual Report



Board of Health



Toronto, Ont.
1898



ANNUAL REPORT

OF THE

Local Board of Health

FOR THE

YEAR 1898.



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ANNUAL REPORT
OF THE
LOCAL BOARD OF HEALTH
FOR THE YEAR 1898.

To the Chairman and Members of the Local Board of Health.

In compliance with the provisions of the Statute I beg to report to the Board the sanitary work done during the year 1898, and also the sanitary condition of the City, as shown by the Minute Book in which are recorded the proceedings of the Local Board of Health of this City.

During the year the Board held several meetings and the attendance thereat by the members has been exceptionally good.

ESTIMATES, 1898.

The first important matter considered by the members of the Board was the expenditure for the year as estimated by the Medical Health Officer, as follows:

General purposes	\$25,881.00
Isolation Hospital	16,146.82

After the Medical Health Officer had explained the reason for increase in the estimates, as compared with the previous year, they were adopted by the Board and forwarded to the City Council to provide the necessary funds.

HEATING OF ISOLATION HOSPITAL.

The unsatisfactory condition of the heating system of the Isolation Hospital was a matter the Medical Health Officer deemed worthy of consideration, inasmuch as the amount of heat supplied by the heating apparatus in that institution was inadequate and the quantity of fuel consumed was out of all proportion as compared with buildings of a similar size. He recommended that soft coal screenings

be tried as an experiment and that storm sashes be placed on the windows, both of which suggestions were concurred in by the Board, and with these improvements the Board hope to find that the coming winter will see the building comfortably heated.

SMALLPOX HOSPITAL.

The removing of the building reserved for use as a Smallpox Hospital was brought up for consideration by a resolution of the City Council, a copy of which was received from the City Clerk in the month of March last. The matter was subsequently referred to a Sub-Committee to look for a more suitable site, and report to the Board.

The matter is still under consideration, and in the meantime the present building will remain ready for use until further action is taken.

MATERNITY HOSPITAL.

The Medical Health Officer submitted a report in the month of April, recommending that the City Solicitor be requested to prepare the necessary By-law declaring the Act relating to Maternity Boarding Houses and for the protection of infant children, to be in force within the Municipality of the City of Toronto, and that the same be submitted to the Municipal Council for adoption.

This recommendation was concurred in by the Board, and the By-law was subsequently adopted by the City Council.

Immediate steps were taken by the Medical Health Officer to put the By-law into force, and a medical officer was appointed to carry out the provisions of the Act.

All persons desiring to carry on the business of a maternity hospital are now required to register with the Medical Health Officer, and their place of business is properly inspected and supervised.

PUBLIC SCHOOL BUILDINGS.

Several enquiries having been made regarding the sanitary condition of the Public Schools of the City. The Board thought that in order that the public might be in a position to know the true facts in connection therewith, the Medical Health Officer should prepare a general report on the sanitary condition of the schools of this City.

DUMPING IN THE LAKE.

The City Council by resolution directed the attention of the Board to the fact that it had been pointed out that material dredged from the bay was being dumped in the lake in too close proximity to the mouth of the water intake pipe. The Board ordered that the Medical Health Officer should communicate with the Harbor Commissioner's, Dredge Owners and the City Engineer, requesting that no dredgings be dumped in the lake in any place that might contaminate the city water.

The action of the Board has proved to be a wise one inasmuch as there has been no further complaint.

OUTBREAK OF SMALLPOX.

On the 6th December the Medical Health Officer reported that two cases of smallpox had occurred in the City, viz.: At 32 Phoebe Street, and 16 Garden Avenue. The patients were removed to the Isolation Hospital immediately upon discovery, and the houses, occupants and contents were quarantined.

Every care was taken by the Department to prevent the spread of the disease.

In order that there should be no further outbreak of the disease, it was decided to open public vaccination stations in different sections of the City.

ICE CUTTING.

The cutting of ice is now carried out under the direct supervision of the Medical Health Department, and the system in operation has proved satisfactory to the public generally.

CLEANING THE CITY.

The usual spring inspection of back yards was carried out under the Medical Health Department, and the Street Commissioner's staff had all refuse and rubbish carefully gathered up and destroyed.

The work in connection with the general cleaning up of the City in the Spring is done systematically, and very little complaint is made in connection therewith.

ISOLATION HOSPITAL.

The Isolation Hospital has done much to rid the City of disease and the value of such an institution to the citizens cannot be over estimated. The staff in connection therewith have done their work nobly and well.

PLUMBING AND FOOD INSPECTION.

The officials to whom have been assigned the duties of plumbing and food inspectors have had a large amount of work during the year, all of which has been done to the entire satisfaction of the Board.

SANITARY CONDITION OF THE CITY.

The sanitary condition of the City continues to be good, and the Department, of which Dr. Sheard is head, deserves great credit for the care and attention given by them to the duties connected with carrying out the health laws, thereby preventing the spread of disease.

The report of the Medical Health Officer, which is annexed hereto, gives in detail the work carried out under his supervision during the year.

All of which is respectfully submitted.

Your obedient servant,

JOHN BLEVINS,
*City Clerk and Secretary
of the Local Board of Health.*

REPORT
ON THE
SANITARY CONDITION
OF THE
CITY OF TORONTO
ALSO AN
Account of the Operations of the Board of Health and the
Vital Statistics
FOR THE YEAR 1898
BY
CHARLES SHEARD, M.D.,
Medical Health Officer.

MEMBERS OF LOCAL BOARD OF HEALTH.

HIS WORSHIP THE MAYOR.

ALDERMAN DANIEL LAMB.

“ BERNARD SAUNDERS.

“ ADAM LYND, M.D.

EX-ALDERMAN THOS. ALLEN, Esq.

“ W. T. R. PRESTON.

ALDERMAN JAMES CRANE, *Chairman.*

CHARLES SHEARD, M.D., *Medical Health Officer.*

JOHN BLEVINS, *Secretary.*

REPORT
ON THE
Sanitary Condition of the City of Toronto
ALSO AN
ACCOUNT OF THE OPERATIONS OF THE BOARD OF
HEALTH AND THE VITAL STATISTICS
FOR THE YEAR 1898.

To the Chairman and Members of the Local Board of Health:

Gentlemen,—I have the honour to submit the Annual Report of the Medical Health Department for the year ending October 31st, 1898. The work of the Department has been very similar to that of previous years, with the additional work imposed upon the Department by the Act to regulate Maternity Boarding Houses, and for the Protection of Infant Children, which was put in force in the Municipality of the City of Toronto by By-Law of the Municipal Council, passed in May, 1898.

The method of house disinfection and inspection where contagious disease has been reported to exist has been practically the same as that of previous years, the Bichloride of Mercury method for house disinfection being still used by the Department. Owing to the expense and difficulty in applying Formaldehyde, it has not been generally employed by the Department, although it is a substance which bids fair to come into general use when the cost has been reduced so as to be within reach.

There has been a material reduction in the three diseases—Diphtheria, Scarlet Fever and Typhoid, the total number of cases reported, from January to December of the year being :

Diphtheria.	Scarlet Fever.	Typhoid Fever.
426	810	151

as against the following figures for the previous year:

Diphtheria.	Scarlet Fever.	Typhoid Fever.
719	1,384	189

There are many conditions within the Municipality which require consideration, and which demand an improvement of the general sanitary state. Prominent among these is the adoption of some process for the ultimate disposal of the sewage of the City. Numerous complaints have been made to the Health Department regarding various localities along the water front, and I have during the past year furnished to the Local Board of Health a special report dealing with the entire question, and urging upon the Council the wisdom of deciding upon some definite plan for dealing with the City sewage.

It is a matter which cannot be very long delayed. With the improvements shortly to be made in the City's harbour it becomes imperative that some definite plan should be agreed upon. The main obstacle to the carrying out of the work appears to be the expense of it. In a few years the water front will probably be rearranged in accordance with the extension and enlargement of the wharves to the Windmill line. Some of the sewers will be carried southward, and the ground prepared by filling, piling, etc., and great loss will be incurred to the Municipality unless it is settled what method is to be adopted to ultimately deal with the sewage of the City of Toronto, and to proceed with the subsequent work relating to the improvement of the water front with due regard thereto.

The old idea of putting crude sewage into water is now pretty generally discountenanced by sanitarians and engineers, and those who were formerly willing to recommend and adopt the trunk sewer scheme as in itself sufficient and complete to solve the question, are now prepared to admit that such construction would be but one step towards the solution of the problem.

The continued deposition of sewage in Toronto Bay requires a certain amount of dredging to be done annually, and the sewage being removed from the seat of deposit, and carried further out into the water, a large portion of it subsequently returns to one point or another.

In addition to the obstruction offered to navigation by the deposition of sludge, the lodgement of offensive matter under the wharves, and along the cribbing, constitutes more or less of a nuisance, and such accumulations have to be treated, or entirely removed at certain times, as during the warm weather.

Effete matter, which constitutes the principle part of the solids of sewage, belongs naturally to the land, as a manural product, and any system which designs to dispose of it in water is, to start with, wrong in principle. The project of conducting the sewage of the City of Toronto to some point east of the Municipality and there depositing it, would not, if carried out, be free from risk, besides being in all probability a source of annoyance to those who occupy the land adjacent to the seat of the output. It therefore becomes a question for the Municipality to determine whether they are to dispose of it on the land by broad irrigation, after the manner of a sewage farm, or by the process of filtration, in which it could be thoroughly and perfectly transformed by the process of nitrification, or whether by some temporary process of straining, precipitation and filtering.

It can be said that cities of any size which have adopted the process of chemical precipitation alone, have not found it perfectly satisfactory, and it has always proved expensive in the matter of maintenance.

The soil in some locations in the vicinity of the City is well adapted for sewage filtration, and as that process is the one which appears to be most suitable for cities of large size, and the least expensive to conduct, it should receive careful consideration as affording a means for a possible solution of the difficulty.

Some form of intercepting or trunk sewer will undoubtedly be required, and as the drainage of the greater part of the City of Toronto is southward and eastward, and as the character of the land in the eastern portion of the City appears to be better suited for sewage disposal than that of the western, the construction of a trunk sewer appears to be the first step in the work, and one which, in my opinion, should be arranged for with as little delay as possible.

One of the great difficulties which confronts us in the matter is the fact that the pumping of sewage appears to be a necessity, and will add materially to the cost of maintenance of any system adopted, and it might be well in this connection to remember the enormous consumption and possibly unnecessarily large waste of water in this City.

In many cities and towns in England twelve gallons per capita is the average consumption, and in cities of the United States, liberal

in the use and supply of water, sixty gallons per capita is the average quantity used, whilst in the City of Toronto, if the estimate as determined by the operations of the pumping plant of the Water Works system can be at all relied upon, 100 gallons per capita will scarcely cover the water consumption of the City. This must materially increase the volume of the sewage, and the means for diminishing the waste of water will be urged upon us when the sewage problem is to be dealt with.

CONTAGIOUS DISEASES.

Scarlet Fever and Diphtheria, which have prevailed in the City during the past year, have been of an exceptionally mild form. There have been but seventeen deaths from Scarlet Fever, and but sixty from Diphtheria, which for a city of 200,000 population, indicate extremely low rates of mortality for these diseases.

The mildness of these affections constitutes a material difficulty in their isolation and suppression, as such cases are often overlooked entirely, and do not come to the knowledge of the Health Department. Many so called sporadic cases of both disease, if they could be thoroughly traced out, would undoubtedly be found to originate in some previously infected patient, who was almost, if not entirely immune to the evil effects of the poison, but infective to others, and we have repeatedly found, during the last year, as in previous years, that a single infection will manifest great variety in its effects upon the different people who have been exposed.

The following shows the number of cases and deaths reported to the Department for the official year ending on October 31st:

	Cases reported.	No. of deaths.
Scarlet Fever	628	17
Diphtheria	474	60
Typhoid Fever	156	36

STATEMENT OF CASES OF CONTAGIOUS DISEASES REPORTED DURING
VARIOUS YEARS.*Typhoid Fever.*

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1892	27	16	9	11	25	19	25	57	88	69	49	31	426
1893	35	111	239	43	15	13	6	20	27	27	25	15	476
1894	11	12	7	51	11	6	6	34	38	29	34	10	249
1895	8	15	7	5	5	6	17	37	62	141	47	18	368
1896	12	2	6	10	5	6	25	75	105	56	24	10	334
1897	7	13	11	9	12	5	11	19	33	44	15	20	199
1898	13	10	4	11	6	3	3	20	23	28	17	13	151

Scarlet Fever.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1892	49	99	74	63	55	47	29	21	38	53	75	68	671
1893	100	70	50	52	77	48	56	19	20	33	35	24	554
1894	28	33	47	34	55	18	25	24	25	29	20	24	371
1895	17	18	14	5	6	7	8	9	6	6	5	12	113
1896	3	8	7	2	3	4	5	3	18	44	44	71	212
1897	104	172	265	205	212	180	59	26	26	30	57	48	1,384
1898	51	42	41	32	32	40	46	48	70	121	147	140	310

Diphtheria.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1892	141	182	150	163	141	122	75	41	75	195	174	146	1,625
1893	115	79	100	57	84	57	20	30	21	40	30	41	583
1894	40	28	21	23	25	15	12	11	13	32	37	81	338
1895	81	52	39	33	46	41	34	16	24	38	49	53	506
1896	73	47	47	30	45	37	28	23	25	50	64	93	562
1897	63	80	85	78	78	52	45	50	35	38	65	70	719
1898	65	47	25	23	33	22	23	27	34	40	50	37	426

MEAT AND FOOD INSPECTION.

From November 1, 1897, to October 31st, 1898, the following animals passed through our Cattle Market for export and home consumption :

Cattle	146,047
Hogs	287,644
Sheep	82,965
Calves	5,641
Total	522,297
Increase	80,217

Of the above, 76 were found to be affected with Actinomyces, or other diseases. These animals were subjected to competent veterinary inspection, slaughtered, and carefully examined, and where the disease was found to be strictly local, the affected parts only were destroyed. The carcasses of eight cattle and one sheep were for this cause cremated.

Eight cattle, 137 hogs, 72 sheep and 7 calves died on the cars, or in the market, from injuries received during transit. These were duly consigned to the rendering tank, to be converted into patent manure, and thus kept out of our food supply.

SHOP INSPECTION.

Number of inspections of butcher shops other than those in public markets	3,412
Shops where poultry and fish are sold	2,170
Shops where bread is sold	6,223
Total number of inspections	11,805

MARKET INSPECTIONS.

The St. Lawrence Market is visited daily, as also in the season, is the Fruit Market, and Yonge Street Wharf. The other markets are taken with the streets on which they are located.

CONFISCATION.

The following is the list of confiscations made during the year indicated:—

4,731 lbs. of beef, mutton and veal.
3,650 lbs. livers, hearts and kidneys.
3½ barrels spare ribs.
27,482 lbs. of fish.
15 gallons of oysters.
6 barrels of oysters.
27 barrels of fish.
33 kegs of salmon trout (salted).
52 cases of finnan haddies.
163 cases finnan haddies (loose).
133 cases mackerel (loose).
18 cases lobsters.
61 boxes of smelts.
8½ baskets of ciscoes.
95 turkeys.
7 geese.
26 ducks.
68 chickens.
1 box of plovers.
1 case of turkeys.
12 baskets of peaches.
5 barrels of apples.

5 cases pears.
 1 basket cherries.
 19 barrels sweet potatoes.
 23 crates of grapes.
 2 baskets of tomatoes.

Bread and butter confiscated for being short weight was distributed as follows :

Bread.	Butter.
337 loaves....Hospital for Sick Children....	68 rolls.
348½ loaves....House of Industry	47½ rolls.
111 loaves....House of Providence	67 rolls.
46 loaves....Boy's Home	40 rolls.
54 loaves....Girl's Home	32 rolls.
111 loaves....Children's Shelter	78 rolls.
36 loaves....Working Boys' Home	10 rolls.
435 loaves....Protestant Orphan's Home ..	53 rolls.
25 loaves....Sunnyside Home	
1,503½ loaves, total.	Total.. 395½ rolls.

ROBERT AWDE,
Inspector

INSPECTIONS

MADE BY THE CITY HEALTH DEPARTMENT OF

COW BYRES OUTSIDE THE CITY.

M.H.—3.

INSPECTIONS MADE BY THE CITY HEALTH DEPARTMENT OF COW BYRES OUTSIDE THE CITY.

Report No.	Station.	No. of Cattle	Quantity of Milk shipped	General Condition of Premises.	General Condition of Cattle.	Water Supply.	Ice Supply.	Feed.
1	Islington	16	Gla. 40	Good	Good	Spring	Humber	Grain and hay.
2	"	14	25	"	"	Well	"	Ensilage, hay and turnips.
3	"	37	76	Drain'ge not good	Not well bedded.	"	"	Ensilage, grain, peameal, cornmeal, turnips and hay.
4	"	15	26	Good	Good	"	"	Ensilage, turnips and mangels. No grain.
5	"	16	26	"	"	From creek	"	Ensilage, peameal and bran. No roots, but chopped hay.
6	"	46	102	First-class	"	Well	"	Ensilage, peameal and cut hay.
7	"	14	34	Good	"	"	"	Ensilage, clover, hay, shorts, bran and peameal.
8	"	14	26	First-class	"	Pump	"	Peameal, cornmeal, cut straw and hay. No roots.
9	"	13	26	Good	"	Well	"	Turnips, hay, peameal, cornmeal and shorts.
10	"	6	18	"	"	"	"	Grains and hay.
11	"	8	18	"	"	Well in barnyard surrounded by water, impure.	"	Ensilage, turnips and cut chaff.
12	"	72	139	"	"	Spring	Humber	Ensilage, cut clover, peameal, cofumeal, oats ground and bran.
13	"	8	18	Stable, low, wet and dirty.	Not clean	Well	"	Mangels, peameal and hay.
14	"	10	17	Good	Fairly clean	From creek	"	Roots, peameal, Ft. Credit corn and hay.
15	"	7	21	"	Good	Well	"	Hay, turnips, peameal, and barleymeal.
16	Burnamthorpe	9	18	"	"	"	Humber	Chopped hay, ground grains and Ft. Credit corn.
17	"	14	26	"	"	Spring	Port Credit	Chopped hay, turnips, oat and peameal.
18	"	5	9	"	"	Well	"	Cut hay, peas and oatmeal ground together.
19	Islington	15	36	"	"	"	Humber	Ensilage, cut hay, pea and cornmeal.
20	"	10	44	"	"	Spring	"	Hay and straw, cut turnips and cornmeal.
21	"	9	17	"	"	Well	"	Malt combs and cut hay.
22	"	11	26	"	"	"	Humber	"

	Islington	9	25	Good	Good	Rain water in cemented tanks.	Humber	
24	"	12	18	"	"	Well	Grenadier	Hay, mangels, Pt. Credit corn.
25	"	11	18	"	"	"	Humber	Clover, hay, oats, peameal and turnips.
26	"	6	8½	"	"	Spring	"	Peameal, crushed grain and hay.
27	"	10	18	"	"	Well	"	Turnips, mangels and clover hay.
28	Summerville	10	22	"	"	Spring	Port Credit	Bran, shorts and peameal, hay, mangels, turnips.
29	"	14	17	"	"	"	"	Cut straw and hay, meal of oats and peas mixed.
30	"	6	5	"	"	Well	"	Roots and meal, shorts and clover hay.
31	Islington	6	5	"	"	"	"	Pea and cornmeal, clover, hay, turnips and carrots.
32	"	7	8½	"	"	"	"	Ensilage, Port Credit corn, hay and turnips.
33	"	9	12	"	"	"	Lambton	Ensilage, turnips, Port Credit corn, peameal and hay.
34	"	7	8½	"	"	"	"	Ensilage, roots, straw, hay and peameal.
35	"	22	26	"	"	"	"	Port Credit corn, chopped oats and peas.
36	"	19	25	"	"	"	"	Cut hay, mangels and turnips, cornmeal and peas mixed.
37	Summerville	9	17	"	"	"	"	Turnips, hay, ground oats, bran and corn.
38	"	19	26	"	"	"	Port Credit	Ensilage, shorts, bran, Port Credit corn and hay.
39	Cooksville	15	8½	"	"	Creek	"	Hay, straw, turnips, shorts and peameal.
40	"	12	17	"	"	Well	"	Hay, corn, ground oats, carrots and turnips.
41	"	15	17	"	"	"	"	Peameal, bran, corn and cornmeal.
42	Dixie	4	9	"	"	"	"	Hay, corn and shorts.
43	"	8	17	"	"	Spring	"	Carrots, turnips, meal, bran and hay.
44	"	11	28	"	"	"	Credit River	Port Credit corn, bran, gluten maize.
45	"	16	26	"	"	Well	"	Hay, roots and meal.
46	"	11	17	"	"	Creek	"	Roots, bran and shorts, hay and Pt. Credit corn.
47	Burnamthorpe	10	17	"	"	Well	Credit River	Carrots, mangels, corn, cornmeal and oats mixed.
48	Summerville	12	3	"	"	Spring	"	Chopped oats, hay and corn.
49	"	12	26	"	"	Well	Port Credit	Turnips, carrots, mangels, sugar beets, mixed meal and hay.
50	Burnamthorpe	5	"	"	"	"	"	Pt. Credit corn, oatmeal, peameal and bran.
51	Burnamthorpe	8	17	"	"	Spring	Credit River	Corn, peameal, cornmeal, oats, bran and turnips.
52	"	15	26	"	"	Well	"	Clover hay, cornmeal and shorts, turnips, mangels and carrots.
53	"	8	17	"	"	"	"	Oatmeal, bran, cornmeal, turnips and hay.
54	"	8	8½	"	"	"	"	Cornmeal, peameal, oatmeal, turnips and hay.
55	"	9	17	"	"	Spring	"	Hay, cornmeal, oats and cut chaff.
56	"	11	8½	"	"	Well	"	"
57	"	"	"	"	"	"	"	"

INSPECTIONS MADE BY THE CITY HEALTH DEPARTMENT OF COW BYRES OUTSIDE THE CITY.—Continued.

Report No.	Station.	No. of Cattle	Quantity of Milk shipped	General Condition of Premises.	General Condition of Cattle.	Water Supply.	Ice Supply.	Feed.
58	New Toronto ..	5	8½	Dirty	Cows healthy, but dirty	Well	Grenadier	Peameal, bran and hay.
59	"	7	2	No drainage	Good	"	"	Hay and straw cut, no meal, no roots.
60	"	4	"	Good	"	Well	"	Hay, straw, bran, oats and meal.
61	"	8	8½	"	"	Spring	Port Credit	(Cut hay and shorts, clover, bran and ground oats
62	"	5	9	"	"	Creek	Etobicoke	Hay, peameal, chopped oats, bran and chopped straw.
63	Lake Road	13	17	"	"	Well	Grenadier	Hay, chopped oats, pea and oatmeal, mixed turnips and shorts.
64	"	14	25½	"	"	"	Pt. Credit	Shorts, gluten meal, corn, oats, turnips and hay
65	"	20	42	"	"	"	Credit River and Grenadier.	Clover hay, turnips, meal, shorts and bran.
66	Port Credit	6	8½	"	"	River	Credit River	Hay, peameal, shorts, corn and cut chaff.
67	"	31	86	"	"	Well	"	Cut hay, shorts, bran, straw, turnips and carrots
68	"	4	4	Not kept clean	Dirty	"	"	Turnips, corn, hay and straw.
69	"	17	17	Good	Good	Creek	"	Turnips, corn, peameal, oatmeal, and cut hay.
70	"	15	17	"	Fair	Well	"	Hay, cut straw, ensilage, turnips, mangels and bran.
71	"	20	17	Stable not very clean	Good	Spring	Pt. Credit	Peameal, chopped straw, hay and turnips.
72	Weston P. O.	12	20	Good	"	Well	Humber	Hay, straw, mangels and mixed meals.
73	"	10	15	Bad drainage	Somewhat dirty	Spring	"	Cornmeal, clover, cut chaff and straw.
74	"	14	17	Good	Good	Well	Humber	Oats, corn, and other meal, hay and straw.
75	Highfield	30	†	No drainage	"	"	"	Oatmeal, peameal, cut straw, and hay.
76	Thistle town	10	17	Good	"	"	"	Barley and oats, ground together, peas and straw
77	"	10	17	"	"	"	Humber	Pea and oatmeal clover, hay and turnips.
78	"	14	30	"	"	Spring	"	Turnips, clover hay, meal of peas and oats, corn, screenings and bran.

*Does not send milk to the City.

† Sells cream only, (4 Gallons).

79	Thistleton	6	Good	Good	Well	Humber	Bran, cornmeal, turnips, oat straw and clover hay.
80	Etobicoke	7	"	"	"	"	Turnips, peameal, shorts, bran and clover hay.
81	"	8	"	"	Creek and Spring	"	Cornmeal, shorts, mangels and hay.
82	Thistletown	16	Good, except one cow which has Actinomycosis of the upper jaw	Good	Creek	"	Turnips, meal of oats, peas and corn.
83	"	10	"	Good	Well	"	Turnips, oat and cornmeal, and clover hay.
84	"	6	"	"	"	Humber	Mixed meal with turnips and hay.
85	"	4	"	"	"	"	Bran, turnips, oat hay and straw, and cut chaff.
86	"	6	"	"	"	Humber	Turnips, ensilage, meal, chopped hay and grain.
87	"	8	"	"	"	"	Turnips, ensilage, chopped barley and hay.
88	"	13	"	"	River	Humber	Chopped oats, cornmeal and hay.
89	"	6	"	"	Well	"	Turnips, oat and peameal and oat straw.
90	"	9	"	"	"	"	Mixed meals, cut straw, hay and turnips.
91	"	8	"	"	"	"	Pea and oatmeal, turnips, mangels and chaff.
92	"	9	"	"	"	"	Turnips, mixed meal of corn, peas and barley.
93	Woodbridge	6	"	"	"	"	Clover, ensilage, corn, corn and peameal mixed.
94	"	8	"	"	Cistern	"	Mixed meals, hay, straw and turnips.
95	Humber	8	"	"	Well	"	Cornmeal and turnips, cut feed and hay.
96	Thistletown	5	Good, except one cow which is very thin and sick	Good, except one cow which is very thin	Cistern	"	Chaff, meal, hay and mangels.
97	Smithfield	10	"	Good, except one cow which is very thin	Well	"	Ensilage, chaff, pea and cornmeal and hay.
98	"	12	"	Good	Spring	Humber	Turnips, mixed oat and peameal and hay.
99	Thistletown	16	"	"	Well	"	Corn, oats and bran mixed, turnips and hay.
100	"	5	"	"	River	"	Oat and peameal and hay.
101	Woodbridge	11	"	"	Well	"	Mixed meals, bran and shorts, turnips, hay and ensilage.
102	Thistletown	6	Very dirty	"	Creek	Humber	Shorts, bran, hay, cut straw and turnips.
103	Woodbridge	14	Good	"	Well	"	Turnips, mixed meals, chopped hay and straw.
104	"	17	"	"	Creek	Pine Pond	Mixed meal, hay and turnips.
105	"	8	"	"	Well	"	Cornmeal, shorts, pea chaff, hay and turnips.
106	"	9	"	"	"	"	Cut straw, mixed meal, turnips and hay.
107	"	10	"	"	"	Humber	Mixed meals, turnips, hay, cut chaff and corn

INSPECTIONS MADE BY THE CITY HEALTH DEPARTMENT OF COW BYRES OUTSIDE THE CITY.—Continued.

Report No.	Station.	No. of Cattle	Quantity of Milk shipped	General Condition of Premises.	General Condition of Cattle.	Water Supply.	Ice Supply.	Feed.
108	Woodbridge	11	17	Good	Good	Well	Humber	Turnips, cut straw and chopped mixed meals.
109	Thistletown	8	26	"	"	"	"	Corn, shorts, hay and turnips.
110	Emery	6	12	"	"	Spring	Humber	Cut oat straw and hay, cornmeal and shorts.
111	"	7	8	"	"	Well	"	Mixed meal, hay and oat straw.
112	"	8	17	"	"	"	"	Hay, oats, chopped corn and meal.
113	"	17	25	"	"	Spring	Humber	Mixed meal, cut straw and hay.
114	"	11	26	"	"	Well	"	Cornmeal, hay, cut straw and turnips.
115	"	8	17	"	"	"	"	Hay, straw, mixed meal and turnips.
116	"	8	17	"	"	Spring	Humber	Ensilage, turnips, cut straw and mixed meal.
117	"	8	10	"	"	Well	"	Ensilage, chopped hay and pea straw, and mixed meal.
118	"	10	17	"	"	By wind-mill.	"	Cut hay and straw, mixed meal and turnips.
119	"	8	17	"	"	Well	"	Peas, oats, barley meal and clover hay.
120	"	6	8½	"	One cow dirty	"	Pine Grove	Bran, mixed meal, turnips, white carrots and clover hay.
121	"	15	17	No drainage	Good	"	Humber	Mixed meal, cut straw and hay.
122	"	12	25	Good	"	Spring	"	Mixed meal and cut straw.
123	Pine Grove	9	17	"	"	Well	Pine Grove	Clover hay, mixed meal and turnips.
124	Edgeley	10	17	"	"	"	"	Mixed meal, hay, cut straw, corn and turnips.
125	"	10	20	"	"	Creek	"	Mixed meal, hay, cut feed and turnips.
126	"	12	24	"	"	Well	"	Ensilage, cut corn, oil cake and cotton-seed meal.
127	Weston	8	17	"	"	Humber	"	Shorts, oatmeal, cut straw and hay, mangels and straw.
128	"	8	15	"	"	Well	"	Cornmeal, chopped oats, cut straw and hay.
129	Eglinton	13	28	"	"	Spring	Hogs Hollow	Cut corn, pea and wheatmeal and brewer's grains.
130	"	55	75	"	"	"	"	Cornmeal, bran, oats, peameal, cut hay and ensilage.
131	"	9	12	"	"	Well	"	Shorts, bran, oat cake, cut hay and chaff.

132	Eglinton	20	30	Good	Good	Spring	Cut clover, cotton-seed meal, crushed oats and cornmeal.
133	"	3	4	"	"	Well	Hay, straw and meal.
134	"	9	7	Dirty	Dirty	"	Hay, brewer's grain and meal.
135	"	7	7	Good	Good	"	Cut chaff, hay and roots.
136	"	35	50	"	"	York Mills	Clover hay, peameal, shorts and ensilage.
137	Forest Hill	7	13	"	"	"	Chopped oats, peameal, hay and turnips.
138	"	12	25	Stables badly ventilated.	"	Pond	Cut straw, hay, turnips, bran and shorts.
139	Bedford Park	18	50	Good	"	"	Turnips, ensilage, cut clover, hay, straw, pea and oatmeal.
140	Eglinton	9	16	"	"	Grey's Mills	Turnips, peameal, bran, cut corn and hay.
141	"	16	34	"	"	"	Gluten meal, bran, shorts, pea and oatmeal, hay and turnips.
142	"	17	34	"	"	York Mills	Cut hay and straw, corn, gluten meal, bran and shorts.
143	York Mills	14	16	"	"	"	Bran, peameal, cut clover and straw.
144	"	7	8	"	"	Spring	Oat and peameal mixed, hay and chopped straw
145	"	9	10	"	"	Well	Cut straw, hay, peameal, bran, shorts, oatmeal and maize.
146	"	9	10	"	"	Spring	Turnips, cut straw and hay, peameal, bran, shorts and oats.
147	Lansing	17	34	"	"	Well	Pea and cornmeal, shorts and clover hay.
148	"	9	16	"	"	"	Meal, bran, shorts, corn, peameal, cut straw and clover hay.
149	Don P. O.	21	34	"	"	Spring	Bran, shorts, cornmeal, turnips, cut hay and straw.
150	"	18	40	"	"	Well	Turnips, brewer's grain, oat straw and hay.
151	"	8	16	"	"	"	Corn, pea straw, turnips, oat and peameal and hay.
152	"	12	16	"	"	"	Chopped hay, pea straw, peameal, oatmeal and turnips.
153	"	11	24	"	"	"	Turnips, cornmeal, bran, shorts, chopped corn and hay.
154	"	10	20	"	"	"	Oats, shorts, peameal, turnips, chopped corn and hay.
155	"	9	16	"	"	Spring	Peameal, shorts, cut corn, hay and turnips.
156	"	9	16	"	"	Well	Corn, turnips, meal and hay.
157	York Mills	20	32	"	"	Mill Pond	Turnips, oat and peameal and clover hay.
158	"	15	15	"	"	York Mills	Bran, oats and peameal, turnips, hay, cut straw

INSPECTIONS MADE BY THE CITY HEALTH DEPARTMENT OF COW BYRES OUTSIDE THE CITY.—Continued.

Report No.	Station.	No. of Cattle	Quantity of Milk shipped Gls.	General Condi- tion of Premises.	General Condi- tion of Cattle.	Water Supply.	Ice Supply.	Feed.
159	York Mills.....	31	•	Good	Good	Well	Pond	Oatmeal, turnips, mangels, ensilage and cut straw.
160	Lansing.....	22	34	"	"	"	Pond	Turnips, clover hay, straw, corn, peameal, shorts and gluten meal.
161	Willowdale	12	20	"	"	"	Smith's Pond	Cut oat straw and hay, turnips, pea and oatmeal.
162	Newtonbrooke ..	15	20	"	"	"	Allan's Pond	Wheat, pea chaff, shorts and peameal.
163	"	23	32	"	"	"	"	Peameal, corn, oatmeal, turnips and mangels.
164	"	20	32	"	"	Creek	"	Oat, bran and peameal mixed with hay and cut straw.
165	Elia	9	11	Stables dirty and cramped	Thin but healthy	Well	"	Shorts, chopped oats and hay, and gluten meal.
166	Lansing	13	25	Good	Good	"	Allan's Pond	Cornmeal, oats, shorts, hay and straw and turnips.
167	Elia	12	16	"	"	Creek and Well	Snider's Pond	Gluten meal, corn, maize, bran and chopped hay
168	Lansing	13	16	Fairly clean, but cramped	"	Well	Allan's Pond	Pea and oatmeal, cut straw, hay and turnips.
169	Downsview	8	10	Good	"	"	"	Pea and oatmeal, cut oat straw and hay.
170	"	6	10	"	"	Pond	"	Peameal and chopped hay.
171	"	28	56	Fairly clean	Fairly clean	"	Pratt's Pond	Cornmeal, shorts, hay and turnips.
172	York Mills.....	8	8	Good	Good	Well	Mill Pond	Ensilage, hay, turnips, pea and oatmeal.
173	Lansing.....	8	8	Stables poor, but fairly clean	Healthy, but thin	"	"	Cut corn, chaff and clover hay, turnips and carrots.
174	"	14	16	Not very clean	Fairly clean	"	"	Clover hay, turnips, pea, corn and oatmeal mixed with ensilage.
175	Newtonbrooke ..	7	5	Good	Good	"	Mill Pond	Clover hay, pea and oatmeal.
176	"	21	16	Fair	Not very clean	"	Schmidt's Pond	Crushed peas and oats and cut straw.
177	"	34	50	Good	Good	"	"	Ensilage, turnips, cut clover hay and straw.
178	Thornhill	10	17	"	"	Spring	"	Cut pea straw, corn, mangels, peameal and turnips.

* Not selling milk now.

179	Thornhill	8	16	Good	Good	Well	.....	Schmidt's Pond..	Peameal, gluten meal, cut corn and hay.
180	Newtonbrooke ..	17	84	"	"	"	.....	"	Cornmeal, bran, shorts, cut straw and clover hay
181	"	18	21	"	"	Cistern	.....	"	Shorts, cornmeal, turnips, cut straw and hay.
182	"	12	16	"	Fairly clean	Well	.....	Allan's Pond....	Ensilage, gluten meal, mangels, straw and hay.
183	Willowdale	13	34	"	Good	"	.....	Schmidt's Pond..	Ensilage, peameal and shorts.
184	"	16	25	"	"	Pond	.....	.....	Peameal, cornmeal, shorts, chopped oats and turnips.
185	"	16	16	"	Fair	Rain water in tanks	.....	Allan's Pond....	Cut oat straw, hay, turnips, pea and oatmeal mixed.
186	"	9	16	"	Good	Well	.....	Schmidt's Pond..	Turnips, cut straw and meal of mixed grains.
187	"	10	20	"	"	"	.....	"	Corn and peameal, clover-hay and turnips.
188	"	20	46	"	"	"	.....	Pond	Cornmeal, turnips, cut hay and ensilage.
189	Lansing	50	*8	"	"	"	.....	.....	Ensilage, corn and peameal mixed and cut hay.
190	Willowdale	9	16	"	Fair	"	.....	Schmidt's Pond..	Corn, shorts and peameal mixed, mangels and cut hay.
191	Lansing	18	23	Fair	"	"	.....	Allan's Pond....	Mixed meal, corn, peas, oats, and turnips.
192	"	27	†	Good	Good	"	.....	Schmidt's Pond..	Ensilage, cut straw, hay and shorts.
193	"	9	16	Fair	Fair	"	.....	.....	Shorts, cornmeal, cut straw and turnips.
194	"	26	64	Good	Good	"	.....	Schmidt's Pond..	Shorts, cornmeal, gluten meal, ensilage, turnips and hay.
195	"	7	12	Fair	Fair	"	.....	.....	Peameal, bran, shorts, cut hay, straw and turnips.
196	York Mills	17	35	Bad Ventilation.	Good	"	.....	Schmidt's Pond..	Cornmeal, shorts, peameal, gluten meal and cut hay.
197	"	16	34	"	Fair	"	.....	Pratt's Pond....	Cornmeal, shorts, gluten meal and peameal, cut hay and straw.
198	"	15	34	Fair	Good	"	.....	"	Peameal, cornmeal, shorts, cut straw, hay and turnips.
199	"	11	25	Good	"	"	.....	"	Mixed meal, gluten, turnips and hay.
200	"	22	38	Fair	"	Spring	.....	"	Corn, peameal, shorts, bran and clover hay.
201	"	9	16	Good	"	Well	.....	"	Mixed meal, turnips and chopped straw.
202	Bedford Park ..	19	36	Fair	Dirty	Town Service	.....	York Mills	Turnips, pea, oat and cornmeal and cut corn.
203	"	10	21	Good	Fair	Well	.....	Don	Ensilage, cut clover hay, shorts, pea meal and bran.
204	"	15	27	Fair	Dirty	Town Service	.....	Pratt's Pond....	Pea and oatmeal, cut straw, hay and turnips.
205	"	13	27	Stables d'k, dirty foul and no ventilation.	"	Well	.....	.....	Brewers' grains, peameal, hay and cut straw.
206	Davisville	11	16	Dirty	"	"	.....	Grenadier Pond..	Brewers' grain, cotton-seed meal, gluten meal, bran, turnips and shorts.
207	Eglinton	8	8	"	"	"	.....	.....	Hay, shorts and brewers' grain.

* and 14 gallons of cream.

† 15 gallons of cream.

INSPECTIONS MADE BY THE CITY HEALTH DEPARTMENT OF COW BYRES OUTSIDE THE CITY.—Continued.

Report No.	Station.	No. of Cattle	Quantity of Milk Shipped	General Condition of Premises.	General Condition of Cattle.	Water Supply.	Ice Supply.	Feed.
208	Near Upper Canada College.	17	36	Good	Good	Well	Grenadier Pond.	Shorts, pea and oatmeal, cut hay and turnips.
209	Leaside J'ct.	19	16	"	"	"	"	Hay, cut corn, pea and oatmeal, turnips, mangels and carrots.
210	"	9	12	"	Fair	"	Don.	Bran, shorts, oatmeal, cut corn, chaff, turnips and mangels.
211	Davisville	3	6	"	Good	"	"	Chopped corn and hay.
212	"	10	17	"	"	"	York Mills.	Corn, clover, hay, turnips, mangels and carrots.
213	"	15	16	"	"	"	"	Pea and oatmeal, bran and straw.
214	"	16	22	"	"	Creek	"	Cornmeal, barn hay, turnips and hay.
215	Eglinton	18	32	"	"	"	"	Hay, cut oats, shorts, bran and turnips.
216	Davisville	11	16	Fair	Fair	Well	"	Crushed oats, cornmeal, turnips and straw.
217	Eglinton	7	12	"	"	"	"	Peas, shorts, straw, chopped hay, turnips and mangels.
218	"	4	5	Dirty	Dirty	"	"	Bran meal and combings hay.
219	Soudan Avenue.	4	8	Fair	Good	"	"	Cornmeal, "mill feed," hay and mill chopped pea straw.
220	"	"	"	"	"	"	"	"
221	Eglinton	13	32	Good	Fair	Town Service	York Mills.	Bran, peas, oatmeal, cut hay and oat straw.
222	"	4	6	"	Good	Well	"	Straw cut and cornmeal.
223	"	6	"	Dirty	Fair	"	"	"
224	"	15	16	Fair	"	Town Service	York Mills.	Turnips, mangels, barley-meal, chopped hay and brewers' grains.
225	Glen Grove	10	20	Good	"	"	"	Cornmeal, cut hay and brewers' grains.
226	Bidford Park	9	6	Fair	"	Well	Grenadier Pond.	Cornmeal, maize, shorts, hay and cut straw.
227	Fairbank	8	16	Good	Good	"	Pond	Pea and oatmeal, mixed shorts, bran, mangels, and cut hay.
228	"	5	4	"	"	"	"	Turnips, mangels, chopped straw and hay.
229	"	6	"	"	"	"	Pond	"

• 6 quarts of cream.

230	Fairbank	11	16	Good	Good	Good	Spring	Rowntree's Pond	Cut corn, hay, shorts and peameal.
231	"	30	20	"	"	"	"	Pond	Oat and peameal mixed, cut hay and turnips.
232	Wychwood Park	18	24	"	"	Well	"	Grenadier Pond	Cornmeal, bran, shorts, oatmeal, flax seed, cut hay and turnips.
233	"	6	14	Fair	Dirty	"	"	L. Simcoe Ice Co.	Bran, shorts, peameal, crushed oats and hay.
234	"	4	4	"	Fair	"	"	"	Hay, bran and mangels.
235	Davisville	3	3	Good	Good	"	"	"	Hay, straw and meal.
236	"	5	6	Dirty	Fair	"	"	Lake Simcoe	Cut hay and straw, comings and crushed oats.
237	"	8	20	Fair	"	"	"	"	Shorts, bran, pea and oatmeal, turnips and hay.
238	Deer Park	2	5	Good	Good	"	"	Mr. Burns	Oat and gluten meal, bran, hay and mangels.
239	St. Clair Ave.	7	24	"	Fair	"	"	"	Cornstalks, bran, shorts, gluten meal, mangels and turnips.
240	"	2	2	Fair	"	"	"	Mr. Fairhead	Gluten meal, cornmeal, bran and hay.
241	"	10	10	Fair	Fair	"	"	Lake Simcoe	Grains, mangels, hay, straw and bran.
242	Shuffle Hill	3	34	Good	Good	"	"	"	Mangels, sugar beets, carrots, shorts, oilcake and hay.
243	Spadina Rd.	3	6	Fair	Fair	"	"	"	Brewers grains, shorts and hay.
244	"	5	4	"	Cows look half Starved.	"	"	"	Hay, mill feed and brewers' grains.
245	Carlton West	19	36	Good	Good	"	"	Grenadier Pond	Ensilage, clover, hay, corn, peameal, bran meal and gluten.
246	Fairbank	10	20	"	"	"	"	Rowntree's Pond	Cut corn, hay, peameal, bran, shorts and mangels
247	Downsview	35	36	but stables too crowded.	Fair	"	"	"	Peameal, shorts, bran, turnips, clover and hay.
248	"	28	40	but stables too crowded.	"	Creek	"	"	Hay and cut straw, pea and oatmeal, shorts and bran.
249	"	19	32	"	Good	Well	"	Pond	Oat and peameal, bran, shorts, clover hay, ensilage and turnips.
250	"	30	50	Fair	"	Rain Water	"	Caruther's Pond	Cut hay, pea and oatmeal, bran, shorts, cut straw and turnips.
251	"	17	34	Good	"	Well	"	Pond	Hay, mixed meal, ensilage and turnips.
252	Newtonbrooke	12	16	"	Fair	"	"	Schmidt's Pond	Pea and cornmeal, barley-meal and mill feed, cut hay and turnips.
253	"	10	16	"	Good	"	"	Pond	Ensilage, cut oat straw, turnips, mangels and cornmeal.
254	"	17	34	"	"	"	"	"	Peameal, shorts, cut hay and straw.
255	Thornhill	14	24	"	"	"	"	Schmidt's Pond	Ensilage, cornmeal, turnips and gluten.
256	"	7	84	"	"	"	"	"	Corn, oatmeal, mangels, turnips, cut straw and hay.

* Buys 24 gallons per day and retails it.

INSPECTIONS MADE BY THE CITY HEALTH DEPARTMENT OF COW BYRES OUTSIDE THE CITY.—Continued.

Report No.	Station.	No. of Cattle	Quantity of Milk shipped	General Condi- tion of Premises.	General Condi- tion of Cattle.	Water Supply.	Ice Supply.	Feed.
257	Thornhill	18	30	Good	Good	Spring	Schmidt's Pond.	Ensilage, turnips, mill feed, shorts, bran, pea-meal, cut straw and hay.
258	"	26	50	"	"	Well	"	Bran, shorts, pea and cornmeal, gluten, barley and oatmeal, mangels and ensilage.
259	"	40	16	"	"	Creek	Don	Pea and cornmeal, oatmeal, mill feed, mangels and cut hay.
260	"	11	16	"	"	Well	"	Cut hay, straw, rye hay, corn, pea and oatmeal, bran, turnips and mangels.
261	"	14	24	"	"	"	Spring Water	Cut pea straw, mill feed, pea-meal and mangels.
262	"	21	40	"	"	"	"	Ensilage, maize, shorts, chaff, hay, turnips and mangels.
263	Downsview	17	30	"	Fair	Creek	Caruthers Pond.	Cut hay and straw, cornmeal, pea-meal and bran
264	"	17	34	"	"	"	"	Shorts, bran, oatmeal, pea-meal and hay.
265	"	12	14	Stable poor and wet	"	Well	"	Bran, pea-meal, turnips, cut straw and com-bings.
266	"	23	50	Good	Good	"	Humber	Pea-meal, bran, ensilage, clover hay and mangels.
267	Weston	9	16	"	"	Creek	"	Bran, pea-meal, clover hay and turnips.
268	Downsview	21	32	"	"	Well	"	Cut oat straw, pea-meal, bran, turnips and mangels.
269	Weston	17	34	"	"	"	Humber	Cornmeal, oatmeal, bran, cut hay and straw.
270	Downsview	11	19	"	"	"	Snider's Pond	Pea-meal, oatmeal, ensilage and hay.
271	"	10	12	"	"	"	"	Shorts, bran, cornmeal, pea-meal, cut oats and pea straw
272	"	24	28	"	"	Rain Water	"	Oat and pea-meal, bran, clover hay and turnips
273	"	26	58	"	"	Spring	"	Clover hay, ensilage, turnips, oat and pea-meal
274	Davenport	45	61	"	Fair	Well	"	Hay, brewers' grains, shorts, bran, cornmeal and pea-meal.

ICE REGULATIONS.

1. No person shall cut, harvest, or in any way obtain any ice within or without the limits of the City of Toronto, which is intended either for domestic use or for cooling purposes within the said limits, or shall sell, store or distribute within the said limits, any such ice, without having first obtained a permit therefor from the Medical Health Officer of the said City, for which a fee of one dollar shall be paid.

2. No ice shall be sold, delivered or stored within the City of Toronto for domestic use or for cooling purposes (except as hereinafter specially provided), which shall be produced by the freezing of water which, on analysis, shall be shown to be other than that of absolute chemical purity, and upon bacteriological examination shall show more than 80 colonies of bacteria per cubic centimetre.

3. All ice cut, harvested or intended for cooling purposes only, shall be housed forthwith, after being cut, and when the ice house to which said ice is consigned shall be filled, or shall, in the opinion of the Medical Health Officer, have received its consignment for the season, the said house shall be closed and sealed by the Medical Health Officer or the Sanitary Inspector, and it shall not be opened, nor any ice removed therefrom, save and except with the consent in writing of the said Medical Health Officer.

4. No permit shall be granted in pursuance of these regulations to cut, harvest, sell, store, deliver or obtain ice for domestic use or for cooling purposes (except in cases provided for in section 5 of these regulations), from any portion of Toronto Bay, Ashbridge's Bay, the River Don, the Humber, or in or from any pond, bay, or body of water which has not first been approved of by the Medical Health Officer.

5. The said Medical Health Officer may grant permission for ice to be cut and stored for cooling purposes only from Toronto Bay, and other water in such places and parts as he may select, the said ice to be cut and harvested under the direction of the said Medical Health Officer, and to be housed and stored in houses to be approved or by the said Medical Health Officer, the said houses, immediately after receiving such ice, to be closed and sealed by said Medical

Health Officer, and to be opened with his permission and under his inspection.

6. The Medical Health Officer may grant permission for ice to be delivered for cooling purposes, to tradesmen and others, excepting milk-dealers, dairymen, hotel and restaurant keepers, who have safes or receptacles for the storing of the same, which have been approved by the Medical Health Officer, or a Sanitary Inspector of this Board, and who do not retail or sell ice; provided that any dealer in ice supplying ice to such party or parties for such purposes, shall, before beginning to deliver the same, inform the said Medical Health Officer of the names, addresses and occupations of all parties to whom such dealer is desirous of delivering such ice.

7. All ice to be delivered for cooling purposes shall be carried for delivery in waggons to be approved of by said Medical Health Officer, and which shall be used for no other purpose.

8. All dealers supplying ice to such persons shall, on delivering the same, place and store said ice in the receptacles or safes approved as aforesaid by the said Medical Health Officer or Sanitary Inspector, and shall immediately thereafter secure and seal the same, and the said receptacles or safes shall not, without the consent in writing of the said Medical Health Officer, be opened except by the dealer or dealers supplying the said ice when making their next delivery.

9. All dealers in such ice, before obtaining a permit to deliver ice for cooling purposes, shall enter into good and sufficient bonds, to the satisfaction of the said Medical Health Officer, that no such ice shall be delivered to any person or persons than those named and approved by the said Medical Health Officer, and that these regulations shall be faithfully observed and performed.

10. No person shall store in the same building, ice which has been cut or harvested for cooling purposes only, with ice intended for domestic use.

11. Any ice obtained from a source not approved of by the Medical Health Officer, and stored or used, or intended to be stored or used, within the limits of the said City of Toronto, shall be liable to seizure and confiscation by the Medical Health Officer or by any Sanitary Inspector.

12. Any person convicted of a breach of any of the provisions of these regulations shall forfeit and pay, at the discretion of the convicting Magistrate, a penalty not less than five dollars, and not exceeding the sum of twenty dollars for each offence, and in default of payment of the said penalty and costs forthwith, the said penalty and costs, or costs only, may be levied by distress and sale of goods and chattels of offender, and in case of there being no distress found out of which such penalty can be levied, the convicting Magistrate may commit the offender to the common jail of the City of Toronto, with or without hard labour, for any period not exceeding one calendar month, unless the said penalty and costs be sooner paid.

Before any ice is drawn from the locality mentioned in the permit, a ticket is to be given to the driver by the Medical Health Inspector for the delivery of the same, and the counter check is to be returned by the driver after such delivery.

SANITARY BRANCH.

Classification of Complaints received at Office.

Full and foul privy pits	1,691
Full and foul dry earth closets	60
Foul and wet cellars	180
Filthy yards and premises	205
Defective plumbing and drainage	910
Garbage or manure on lots or in lanes	197
Foul stables	73
Water on vacant lots	20
Water under houses	50
Foul wells and cisterns	6
Foul sewers	40
Miscellaneous	295

Summary in detail of work done in the Sanitary Branch.

Total number of complaints	3,727
“ “ inspections of nuisance complained of....	8,979
“ “ notices and letters issued respecting com- plaints	2,370
“ “ house to house inspections	8,318
“ “ inspections of livery stables	46
“ “ inspections of rag shops	6
“ “ inspections of slaughter houses	15
“ “ inspection of milk depots	2,235
“ “ inspection of cow byres	455
“ “ milk samples taken (retail)	370
“ “ milk samples taken (wholesale)	90

Prosecutions during the year ending October 31st, 1898.

Full and foul privy pits	83
Establishing new privy pits	4
Defective plumbing and drainage	27
Foul cellars	14
Filthy yards	3
Filthy premises	10
Foul water on lots	2
Foul wells	1
Burying contents of privies in yards	2
Dumping night soil on lots	1
Dumping night soil in River Don	4
Offering diseased animal for sale	1
Neglect to report contagious disease	1
Breach of plumbing by-law	20
“ ice regulations	6
“ quarantine regulations	2
“ act to regulate maternity boarding houses	1
“ act for the protection of infant children	2

Number of summonses issued	113
“ cases in court, November 1st, 1897	2
	— 115
“ cases withdrawn (work done)	78
“ cases dismissed	7
“ cases fined	24
“ cases remanded for sentence	4
“ cases still in court (October 31st, 1898) ...	2
	— 115

NATURE OF OFFENCE.	No. of fines.	AMOUNT OF FINES.
For burying contents of privy pits in yards..	1.....	\$ 5 and costs or 10 days.
For dumping night soil in River Don	4.....	20 “ “ 14 “
For defective drainage and foul privy pit....	1.....	5 “ “ 14 “
For filthy yard and stable.....	1.....	5 “ “ 14 “
For neglecting to report a case of contagious disease.....	1.....	1 “ “ 14 “
For breach of Ice regulations.....	3.....	20 “ “ 14 “
For breach of Quarantine regulations.....	2.....	11 “ “ 14 “
For breach of Plumbing By-law	10	30 “ “ 14 “
For breach of Act for protection of infant children	{ 1.....	20 and costs or 6 m'ths.
For breach of Act to regulate Maternity Boarding Houses		5 and costs or 10 days.
	1.....	5 and costs or 10 days.
Total amount of fines.....		\$127

PLUMBING AND DRAINAGE DEPARTMENT.

Permits issued.			Applica- tion for Inspection.	Inspections made.	Smoke Tests.	Notices mailed.	Printed notices mailed to Owners and Agents.
For the Year.	Permits.	Buildings.					
*1896.....	454	585	1882	2242	411	652	410
897	789	1030	3671	3955	836	2528	1624
1898	1194	1597	4927	5597	804	3126	2468

*April to October only.

AMBULANCE REPORT.

Total number of calls received from November 1st, 1897 to October 31st, 1898.

Removed to General Hospital:

Typhoid Fever	50	
Erysipelas	8	
Blood poisoning	8	
Tonsillitis	1	
Quinze	3	
Whooping-cough	2	
Gangrene	3	
Measles	8	
		83

Removed to St. Michael's Hospital:

Typhoid Fever	31	
Erysipelas	1	
Blood Poisoning	3	
Gangrene	2	
		37

Removed to Grace Hospital:

Typhoid Fever	16	
Erysipelas	1	
		17

Removed to Western Hospital:

Typhoid Fever	8	
		8

Removed to Victoria Hospital:

Typhoid Fever	11	
		11

Removed to Isolation Hospital:

Diphtheria	250	
Scarlet Fever	221	
		471

Removed to other houses 6

Total number of calls where ambulance was not required..... 7

640

Total amount collected, \$44.00.

Your obedient servant,

F. HAGUE.

MORGUE REPORT.

Total number of bodies in Morgue:

1897 November	0	1898 May	3
December	1	June	3
1898 January	1	July	4
February	1	August	0
March	2	September	0
April	1	October	1
		Total	17
Male	10	Adults	13
Female	7	Children	4
			17

Your obedient servant,

F. HAGUE.

REPORT OF MEDICAL SUPERINTENDENT OF ISOLATION HOSPITAL.

Isolation Hospital, November 23rd, 1898.

Charles Sheard, Esq., M.D.,
Medical Health Officer, Toronto:

Sir.—I have the honor to submit the following report of the Isolation Hospital, for the year ending November 22nd, 1898.

Patients.—The total number of patients admitted to the Hospital during the year was 599. Of these, 288 were admitted for Scarlet Fever, and 311 for Diphtheria. There were 40 deaths, including 11 that were moribund on their arrival at the Hospital. The general death rate, including the moribunds, was 6.67 per cent., and excluding the moribunds it was 4.93 per cent.

Scarlet Fever.—The number of patients admitted was 288, but two of these upon closer examination were found not to be cases of

scarlet fever, one being a case of measles with broncho-pneumonia, and the other a case of rheumatic fever. Both recovered, and were duly discharged. The exact number, therefore, of scarlet fever patients was 286, of these, 153 were cases of S. Simplex; 131 S. Anginosa; and 12 of S. Maligna. Twenty-one cases were complicated with albuminuria, 42 with adenitis, which in 4 proceeded to suppuration, 39 with otorrhoea, 10 with rheumatism, 1 with ichthyosis, and 1 with eczema. Measles developed in five of the cases during the progress of the disease, and in two of them there was the additional complication of severe broncho-pneumonia. Seven patients died, one being moribund when admitted. The death rate was 2.41 per cent.

Diphtheria.—The number of patients admitted for diphtheria was 311, but 50 of these after careful clinical and bacteriological examination were found not to have the disease. One of the 50 had broncho-pneumonia, and one had cervical cellulitis. Both of them were very bad, and died soon after admission. The remaining 48 were discharged from the Hospital as soon as their removal could be effected. The exact number of cases of diphtheria which had to be dealt with during the year was therefore 261.

Of the 261 cases, 172 had the disease in a mild form, 30 in a severe form, and 59 in a very severe form. Of the total number 150 cases were tonsillar or pharyngeal, 63 were naso-pharyngeal, 33 were laryngeal, and 10 were laryngo-naso-pharyngeal. In a considerable number of the severe cases, and in most of the very severe ones, the disease was attended with cellulitis and albuminuria. Epistaxis also and paralysis, cardiac debility, and many other undesirable complications, were not unfrequently met with.

Five of the cases were of a mixed character, one having syphilis, one measles, with broncho-pneumonia, one chronic Bright's disease, of many year's standing, and two scarlet fever. Two of them—the measles case and the Bright's disease case, died, but this result was expected before and independently of the diphtheria attack.

There were 31 deaths during the year, but ten of these were of patients who were in a moribund condition when brought in, and for whom nothing could be done beyond perhaps smoothing a little the passage to the grave. Death occurred, mostly, within a few minutes to a few hours after admission, not one surviving as long as 24 hours.

Of the 10 moribund, 1 was naso-pharyngeal, 8 were laryngeal, and 1 was laryngo-naso-pharyngeal. Omitting the moribund cases, there were 21 deaths, 12 of which were naso-pharyngeal, 4 laryngeal and 5 laryngo-naso-pharyngeal. Regarding, however, two out of four of these laryngeal cases, death perhaps was really due to broncho-pneumonia, and only remotely and indirectly, if at all, to diphtheria. The patients had recovered entirely from laryngeal stenosis, when broncho-pneumonia supervened, and, after a brief illness, without any return of the diphtheritic symptoms, they expired.

The death rate for the year, including all the cases in the calculation, was 11.87 per cent. Excluding the moribund cases it was 8.36 per cent. Excluding also the two mixed cases, the one of measles with bromo-pneumonia, and the other of chronic Bright's disease, the death rate was 7.63 per cent. And if we exclude, also, the two laryngeal cases, who died from broncho-pneumonia, subsequently to the diphtheric attack, then the death rate for the year was only 6.82 per cent.

None of the deaths occurred among the tonsillar or pharyngeal cases; as usual they took place among the naso-pharyngeal, the laryngeal and the laryngo-naso-pharyngeal patients. There were, not counting the moribunds, 62 naso-pharyngeal cases, with 12 deaths, a mortality of 19.33 per cent. There were 25 laryngeal cases, with, according as we include or not the two who died from broncho-pneumonia, 4 or 2 deaths, and a corresponding death-rate of 16 or 8 per cent.; and there were 9 laryngo-naso-pharyngeal cases, with one death, a mortality of 11.11 per cent.

Respectfully submitted.

G. TWEEDIE, M.D.

REPORTS MADE TO THE MEDICAL HEALTH OFFICER
ON
WORK DONE IN THE BACTERIOLOGICAL LABORATORY,
AND ON
INFECTIOUS DISEASES.

BY
E. B. SHUTTLEWORTH, Phar.D., F.C.S.

REPORT ON CITY WATER SUPPLY.

October 31st, 1898.

Charles Sheard, Esq., M.D.,

Medical Health Officer, Toronto:

Sir,—I herewith submit the results of the regular bacteriological examinations of the water supply of the City, as evidenced by samples taken from the laboratory tap in the St. Lawrence Hall. The numbers refer to colonies of bacteria per cubic centimetre.

1897.			1898.		
Nov. 1.....	270	cols.	May 6.....	675	cols.
" 8.....	545	"	" 14.....	340	"
" 16.....	540	"	" 20.....	390	"
" 23.....	2,975	"	" 31.....	350	"
" 29.....	1,865	"	June 8.....	195	"
Dec. 7.....	2,330	"	" 15.....	275	"
" 14.....	5,980	"	" 22.....	235	"
" 21.....	7,585	"	" 29.....	290	"
1898.			July 7.....	250	"
Jan. 6.....	2,585	"	" 14.....	230	"
" 13.....	3,455	"	" 21.....	390	"
" 20.....	2,980	"	" 28.....	530	"
" 27.....	2,565	"	Aug. 5.....	330	"
Feb. 5.....	1,090	"	" 11.....	416	"
" 11.....	1,505	"	" 17.....	410	"
" 18.....	19,975	"	" 24.....	305	"
" 25.....	5,305	"	Sept. 1.....	345	"
Mar. 3.....	18,900	"	" 9.....	205	"
" 10.....	10,650	"	" 16.....	220	"
" 17.....	5,995	"	" 20.....	280	"
" 24.....	8,095	"	" 29.....	185	"
April 9.....	1,920	"	Oct. 5.....	320	"
" 16.....	6,010	"	" 11.....	550	"
" 22.....	840	"	" 17.....	345	"
" 29.....	666	"	" 27.....	135	"

A comparison of these figures with those of former years can be most readily made by reducing the numbers to monthly averages, as in the following table, in which are given similar figures for the past four years.

Monthly Averages.

	1897-8.	1896-7.	1895-6.	1894-5.	1893-4
November	1,239	2,021	977	1,840	420
December	5,298	4,415	1,788	5,255	2,050
January	2,876	1,281	1,717	2,036	5,235
February	6,968	1,432	3,851	785	7,196
March	10,860	8,716	5,058	5,852	5,172
April	2,357	2,947	8,469	8,983	2,353
May	439	1,178	651	422	1,172
June	248	327	251	495	270
July	350	350	329	542	236
August	385	335	360	326	206
September	247	313	292	1,758	310
October	287	344	406	1,360	342
Aggregate monthly average	2,631	1,980	2,012	2,470	2,080

If the relative bacteriological quality of the water be judged by the aggregate monthly average, the past year appears to be at a marked disadvantage when taken with that which preceded it, and also with the previous three years, though to a less pronounced degree. A conclusion of this kind could not, however, be fairly made, as the average is really dominated by the extremely high figures for the months of February and March.

The truth is more evident when a comparison is made of seasonal results, as in the following arrangement:

Averages by Seasons.

	1897-8.	1896-7.	1895-6.	1894-5	1893-4
October, November, Dec.	2,293	2,280	1,402	2,477	996
January, February, Mar.	6,908	3,809	3,542	2,897	5,867
April, May, June	1,014	1,484	3,123	3,300	1,256
July, August, September.	267	332	327	633	250

This shows the figures for the closing months of 1897 to be practically identical with those for 1896—respectively 2293 and 2280—but in the first three months of 1898 the figures are nearly

double those for 1897, while in the succeeding periods of the year the number for 1898 are considerably less than for the year preceding. It is therefore evident that the unfavorable showing of 1898 is entirely due to the influence of the spring months, and close investigation indicates the heavy easterly storms of February and March last as the direct cause.

The great increase in the number of bacteria during the winter months is, as I have previously reported, mainly due to the prevalence of one species, which, as far as I have been able to determine is identical with *Bacillus Ochraceous*. This organism generally makes its first appearance in November or December, and continues until May or June. It was noticed last term, at the examination made on November 16th, 1897, and it disappeared on June 22nd, 1898, to re-appear on December 2nd.

The influence of this bacillus on the number of colonies counted may be judged from the fact that on February 18th last, when there were 19.975 bacteria per cubic centimetre, no less than 18.905 belonged to this particular species, and on March 3rd there were 18.200 out of 18.900 colonies. I am inclined to think that this is a winter organism, growing only when the water temperature is low, though it is possible that it may naturally develop only at the bottom of comparatively deep water, and be disturbed by violent winter storms. Fortunately the organism is non-pathogenetic.

The Lake Level.

The past year must be classed as one of low water, but is nevertheless a decided improvement on 1897, the average increase in depth being about seven inches. Starting from 1895, the phenomenal year of low level, there has been a slow though steady increase, which it is to be hoped will continue. A high average water level practically means better water, and in other respects, better sanitary conditions. This is undoubtedly so at Toronto Island, where a few inches of water converts an exposed and evil smelling pond bottom into a body of water in which there is generally sufficient circulation to prevent stagnation. The diluting effect on the sewage poured into the Bay is also a very decided advantage.

The maximum height was reached on May 27th and June 12th, when the lake level was $15\frac{1}{2}$ inches above zero (city gauge). The lowest point was touched on October 27th last, when the register indicated $5\frac{1}{4}$ inches below zero. The range from November, 1897

to November, 1898, was therefore $20\frac{3}{4}$ inches. The extremes during the last fifty-five years show a possible range of 67 inches; that is, the level may fall to 18 inches below zero or rise as high as 49 inches above.

The following table shows the fluctuations of level during the official year.

	LOWEST.	HIGHEST.
1897.		
November	$9\frac{1}{2}$ inches below.	4 inches below.
December	11 "	1 inch below.
1898.		
January	$7\frac{3}{4}$ "	$3\frac{1}{2}$ inches above.
February	0 zero.	7 "
March	3 inches above.	$18\frac{3}{4}$ "
April	10 "	18 "
May	10 "	15 "
June	12 "	$15\frac{1}{2}$ "
July	$6\frac{1}{2}$ "	$12\frac{1}{2}$ "
August	$1\frac{1}{4}$ "	$8\frac{3}{4}$ "
September	1 inch below.	$2\frac{3}{4}$ "
October	$5\frac{1}{4}$ inches below.	2 "

Temperature of the Tap Water.

The average temperature of the water supply is ascertained by allowing the flow from the Laboratory tap to continue until the temperature is constant, that is, until surface indications are overcome; the degree indicated will therefore be that of the water in the city mains, and approximately, that of the lake.

The record for the last season is submitted with those for previous years, and is conveniently given in averages for months.

	1894-5.	1895-6.	1896-7.	1897 8.
November	44.4	42.6	42.8	46.7
December	39.9	38.1	38.8	40.5
January	36.1	36.1	36.8	38.0
February	36.5	33.8	33.8	35.2
March	36.5	33.8	36.5	36.8
April	37.4	37.9	39.0	40.3
May	42.9	44.0	43.8	44.1
June	44.0	43.2	44.4	46.8
July	43.8	47.8	54.6	54.7
August	43.2	43.0	49.8	52.8
September		51.6	54.3	53.7
October		47.3	51.3	56.1

The lowest temperature noticed was on Feb. 26th, when 34° F., was reached, and the highest on Oct. 5th, when the mercury indicated 63° F.

On comparing the temperatures of the water for the past few years it appears that last year the water was, in general, slightly warmer than the average. This was a natural consequence of the warmer weather which prevailed through nearly the whole of the season.

Condition of the Conduit.

The work of laying the new steel pipe from the Shore Crib to the Bell Buoy, which had for the past two years been slowly progressing, was brought to successful completion on September 15th, when a connection was made with the 365 feet length of steel pipe which leads from the Bell Buoy to the Intake. The distance from the Shore Crib to the Intake is about 2,700 feet, of which over 2,200 feet is in the Lake. The old wooden pipe, which has been substituted by that now laid, has been shut off at the Shore Crib.

The course of the water from the Intake to the city is now as follows: Intake to Shore Crib, 2,722 feet, 6-ft. steel pipe; Shore Crib to Island Basin, 2,257 feet, 5-ft. steel pipe and 4-ft. wooden pipe, parallel; Island Basin to Hanlan's Crib, 3,570 feet, 5-ft. steel pipe; Hanlan's Crib to Water Works Dock, 4,660 feet, 4-ft. steel pipe and 3-ft. cast iron pipe, parallel. The entire length of the conduit, is therefore about 13,200 feet.

There has not yet been sufficient time to estimate correctly, on a bacteriological basis, the effect of the substitution of the steel pipe for that of wood in the lake section, but during October, when the official year terminated, the bacteriological count was lower than for any similar period since observations of this character have been made. By referring to the table of monthly averages, it will be seen that for the last five years the October records have been as follows: 1894, 342 colonies; 1895, 1,360; 1896, 406; 1897, 344; 1898, 287 colonies. There can be no doubt but the new arrangement will remedy the previous state of things by which the water supply was contaminated by shore water, and that an improved condition will be evident from the bacteriological observations of the coming year.

The Reservoir.

On the night of July 21st, on account of the temporary fall of pressure at the High Level Station, there was an unusual demand on

the reservoir which supplies the City above College Street, and, in consequence of the strong suction, many small fish were drawn into the main and service pipes. The investigation which followed revealed the necessity for the cleaning out of the reservoir. This was decided upon, and on September 21st the work of draining off the water commenced.

The condition of the bottom of the reservoir at this time may be learned from the following extract from my report thereon, dated September 26th.

"This morning the water had been drained off to about a depth of three feet at the lower portion, thus leaving the greater part of the cemented bottom exposed, as well as the entire part which is covered with stone.

The screen which covers the outlet has a mesh of $\frac{5}{16}$ ths of an inch, thus retaining in the reservoir anything larger than this. In the remaining water there were large shoals of small fish, ranging from $\frac{1}{2}$ to one inch in length, and also a few larger fish, but it is quite possible that a large number were concealed in the weeds. Crawfish and tadpoles were exceedingly numerous, with many pond snails.

On the cemented portion, near the outlet, there was growing a bed of *Potamogeton Crispus*, and near by a small patch of *Anarchis*.

The exposed cemented portion of the bottom was covered by a coating of mud about 1-4 to 3-8ths of an inch in thickness, and from its color probably largely organic. This was being removed by 5 workmen, with brooms, who were sweeping the mud towards the deeper portions, and afterwards swilling the cement with water. All this mud could therefore drain into the deep part of the basin and be ultimately carried away.

On the uncemented part of the bottom, comprising over half the area, there is growing over the deeper parts a large bed of an algaceous plant called *Chara*. The growth is very dense, and from three to five inches in thickness. The plant, when decomposing, gives off a very offensive, fishy odor.

Underneath the superficial stones, on which the *Chara* is growing, there is a bed of black mud, of one or two inches in thickness, and this is of an organic and somewhat offensive character.

I beg to suggest the advisability of taking into consideration the question of cementing a portion or the whole of the bottom of the reservoir, if such can be done without risk to the city. If only a part can be accomplished, the deeper portions along the line of the centre and the west part might be advantageously attempted."

The suggestion in regard to cementing the bottom of the Reservoir was carried out by the Engineer's Department, and was completed so far as the appropriation of money would go, by the last week in October.

About one-third the area of the bottom is still unprotected by cement, but it is to be hoped that this will be further reduced next year, when the cleaning operation should be repeated.

ICE LOCALITIES.

Toronto, October 27th, 1898.

Sir,—I visited yesterday the ponds west of Grenadier Pond, with a view of ascertaining their suitability as a source of domestic ice supply. The city map is in error in showing only one pond west of Grenadier Pond, as there are two between Ellis and Windermere Avenues, and another between the latter thoroughfare and the Humber River.

The sources of these bodies of water are apparently similar to that of Grenadier Pond—springs in the high land, on a level with and above Bloor Street; together with the drainage from the small water sheds involved.

The pond immediately east of Windermere Avenue may be called Rolling Mills Pond, while that of west of the avenue may be styled the Bolt Works Pond. The former is much the smaller body of water and is entirely surrounded by marsh, so that, as far as I could see, it is quite inaccessible, and I was told that there is not a boat on this pond, nor on that to the west of it.

There are several houses on Windermere Avenue, the closets of which overhang the bank of the ravine at the edge of the pond. This is also the case with regard to the Bolt Works Pond, there being six houses on so called Blizzard Street, of which the closets overhang, and the drainage all passes into the hollow. There are, besides these, five houses similarly situated on Windermere Avenue. This pond

is in great part surrounded by marsh, and at its eastern extremity is situated the works of the Swansea Forging Company.

I took the necessary apparatus for obtaining samples of water, but could not put it into operation. If such samples are required facilities for taking them will have to be provided.

Considering, however, the marshy character of both these ponds and the danger of contamination by excrementitious matter, I cannot recommend these bodies of water as suitable for domestic ice supply.

Toronto, November, 14th, 1898.

Sir,—On October 31st I visited the pond immediately west of Grenadier Pond, with a view of ascertaining its fitness as a source of ice supply.

This body of water is located immediately to the west of Ellis Avenue, and is supposed to discharge under that thoroughfare into Grenadier Pond. This flow of water was not, however, observable, as the connecting ground between the two ponds is low and swampy.

The source of water for the pond is mainly drainage from the high land surrounding it, and from springs. In this respect it resembles Grenadier Pond, the Rolling Mills Pond, and the Bolt Works Pond. The boundaries of the Pond are almost altogether woodland, and as far as I could see there are not in this respect any features to which objection can be taken.

I traversed the pond in a boat, and took a sample of water from the southerly end, about 60 feet from that limit, and where the depth was about 10 feet. The depth of the pond is stated to be 18 feet, but I judge the greater part of it is much shallower than this, the northerly portion not exceeding 2 feet.

At the time of my visit two men were engaged in raking out weeds, a work in which they were reported to have been engaged for more than a month, and from the accumulation of weeds at the side, this seemed to be the case. I have no doubt the disturbance caused by this collection of weeds has had a temporary deleterious influence on the water. This was evident from a sample I took at the upper end of the Pond, but which contained so many floating particles, that I rejected it.

M.H.—8.

I noticed on the surface of the water a number of specimens of *Lemna Polyrrhiza*, a plant which is more or less characteristic of stagnant water.

A bacteriological examination of the sample of water I obtained showed the presence of 1,175 cols. of bacteria per cubic centimetre. This sample of water, when cold, had a very strong weedy odor, which became exceedingly pronounced on heating. I am of the opinion that this objection alone would be insuperable to the use of ice for domestic purposes from this pond, and the number of bacteria is also relatively too high.

I append a sketch of this and the adjoining ponds, so that their relation to one another may be apparent.

REPORT ON BACTERIOLOGICAL WORK IN CONNECTION WITH DIPHTHERIA.

The application of a bacteriological test as a means of determining the admission and discharge of patients, on the diphtheria side of the Isolation Hospital, has been continued, and found to work very satisfactorily. Up to July 1st, last, the total number of primary cultures of exudates from such patients was 1,298, and there were also examined 1,197 cultures from exudates sent to the Department by city physicians. Of secondary cultures there were 1,815 from the Hospital, and 352 from private patients, making in all 4,662 examinations up to the date specified.

Hospital Admission by Bacteriological Diagnosis. During the year there were 324 cases sent to the Isolation Hospital for diphtheria. The bacteriological test showed 252 or 77.78 per cent. of these to be genuine, and 72, or 22.2 per cent., to be non-diphtheritic. These negative cases were always subjected to a second examination, and, on confirmation of the first conclusion, the patients were at once discharged. As a matter of fact, there are few cases in which second cultures are really required, especially where clinical and bacteriological signs point to the same conclusion, but there are occasional instances in which bacilli of doubtful character present themselves, and can only be safely resolved by fresh swabs and cultures. This necessitates an additional day in Hospital, but the disadvantage is

more than compensated by positive assurance that the patient is free from infection, and fit to again mingle with the public.

The number of these negative cases is fairly comparable with the results of former years as will be evident from the following tabulation:

	CASES.	POSITIVE.	NEGATIVE.
February, 1895 to July, 1895.....	188	75.5	24.5
July, 1895 to July, 1896.....	377	87.6	12.4
“ 1896 to “ 1897.....	409	78.4	21.6
“ 1897 to “ 1898.....	324	77.8	22.2

Of the 400 samples of exudates sent in by city physicians from outside patients, there were 194 or 48.5 per cent. of a negative character.

Comparison with former years gives the following:

	CASES.	POSITIVE.	NEGATIVE.
February, 1895 to July, 1895.....	60	61.7	38.3
July, 1895 to July, 1896.....	182	56.5	43.4
“ 1896 to “ 1897.....	555	40.9	59.1
“ 1897 to “ 1898.....	400	51.5	48.5

Hospital Discharge by Bacteriological Diagnosis. Cases of true diphtheria are retained in the hospital until cultures no longer show the characteristic bacilli. This rule is strictly adhered to, no matter what may be the clinical signs of recovery. The period of hospital detention is often thus prolonged, but the danger of the conveyance of infection out of the institution is greatly reduced, if not altogether avoided. The termination of many outside cases is also frequently and increasingly determined in this way, as physicians more strongly recognise the importance of the bacteriological method.

During the examination of a comparatively large number—2,167—of these progress or secondary cultures, it has been remarked that towards the close of the period of convalescence the diphtheria bacillus is generally accompanied by streptococci, and occasionally staphylococci. When the specific organism disappears the other forms survive, and it is nearly always the streptococci that thus remain. Streptococci may indeed be regarded as the heralds of con-

valescence and the assurances of recovery. I speak of these organisms in a general way, for, judging by morphological characters, there are several species. They are possibly normal mouth organisms which, after the intrusion and destruction of a foreign species, again resume their occupancy. Whether they take any part in bringing about the disappearance of the diphtheria bacillus is an interesting question, and, as I have pointed out in a former report, the solution of this might have a very important application in the therapeutics of the disease.

Reliability of the Bacteriological Method. The reliability of the bacteriological method of hospital admission and discharge has been still further attested by the experience of the past year. Of the 72 rejected patients, and 252 diphtheria convalescents, who were sent back to their friends, not one returned, nor were there any known cases of diphtheria among those with whom they came in contact.

The success of the method depends on certain details which may perhaps be briefly alluded to.

Sterile Swabs. The employment of swabs which have been rendered sterile, say by exposure to a heat of 150°C., for two hours, much facilitates the examination of subsequent cultures. Organisms which are capable of vigorous development on serum, particularly those which have the power of liquifying that medium, are liable to inhibit the growth of the diphtheria bacillus. The presence of less vigorous bacilli in any case complicates matters, and renders microscopic differentiation much more difficult and uncertain than it would be if only mouth organisms were present. Swabs of cotton wool, not the absorbent kind, on the roughened ends of 5-inch rods of No. 15 coppered steel wire, enclosed in 4-inch strong tubes, stopped with cotton wool, answer the purpose admirably.

Exudate. In the case of young children the operator must have an assistant to hold the patient, who should be placed in a strong light. All visible parts of the throat should be carefully inspected and membrane secured if possible. If this cannot be done the swab should be rubbed with some pressure against all likely parts. If the swab be merely introduced into the back part of the mouth and blindly rotated, bacteriological diagnosis becomes a matter of chance, while with operations properly conducted its indications are perfectly

reliable. A swab should not be taken until at least two hours after the application of any antiseptic spray or wash. The preservation of the exudate, until culture, is of considerable importance. The swab should be put in its sterile receptacle and not allowed to become dry before it is passed over the serum. Very frequently the extemporized swab is put into a dirty bottle, or perhaps into one which has contained an antiseptic, probably introduced intentionally to sterilize the vessel, and not completely removed. Attempts at culture are, in the latter case, generally unsuccessful, and failure from this cause is not infrequent. With sterile swabs, and a careful operator, there never should be a case of a sterile serum culture. A fairly extended experience justifies me in saying that if a swab comes well into contact with the mucous membrane of the throat there will always be secured some organism capable of growth on media containing serum.

Media and Cultivation. Of the various media in which the diphtheria bacillus will flourish the preference may be given to some form of serum mixture of definite alkalinity. Such a medium has been constantly in use here for the last three years, and has always proved reliable, though perhaps at its best when neither too new or too old. When fresh, and showing water of condensation, as will be the case where coagulation and sterilization is effected by steam, the staining characteristics of bacilli grown thereon, are not so well marked as when the medium is drier. The limit of dryness is reached when the medium is no longer soft. A temperature of 95° F. seems to give rather better results as to morphology and staining than when blood heat is reached—at least as far as an exposure of 20 to 24 hours is concerned—the tendency to involution is less, and form and size are more regular. Loeffler's methylene stain maintains its preeminence, though the use of Neisser's combination of acid blue and vesuvin is occasionally of use to aid in the differentiation of the true and false bacillus.

Duration of Hospital Term. As the patient's stay in hospital is dependent on bacteriological conditions, the persistence of the bacilli in the throats of the subjects of diphtheria is for the great part coincident with the hospital term. It is not wholly so, inasmuch as there is always a period, generally of a few days duration, before admission to hospital, and in which the disease exists and bacilli could doubtless be demonstrated. If, therefore, the true duration of the disease, or the persistence of bacilli, are to be estimated it will be

necessary to add to the hospital term this preliminary period of say three days.

The average duration of the hospital term of the non-fatal cases of clinically diagnosed diphtheria was 19.55 days, against 26.3 days in 1893, when discharge was solely by clinical evidence. The saving of time, both on the part of the hospital and patient, was, therefore, 6.75 days per patient. If the cost, per day, of maintaining a patient in hospital be taken at 68 cents, the annual saving thus effected would amount to about \$1,350.

The average detention of cases of true diphtheria was 24.50 days, and of the negative cases 4.27 days. Of 30 fatal cases the end was reached at the conclusion of an average of 6.46 days.

As remarked in former reports, there is always a number of provokingly persistent cases, in which the bacilli resist for a long time all attempts at their destruction. There were 11 instances in which infection remained for over 42 days, the numbers being respectively 42, 42, 44, 47, 49, 55, 57, 60, 65, 77 and 128. These high numbers raised the general average very considerably, and were not to a corresponding extent set off by brief terms. The shortest of these was 5 days, the patient being 46 years of age. The others ran for 7, 7, 8, 8 and 9 days, the patients being respectively 5½, 23, 59, 26 and 8 years of age.

The very tedious case, No. 3,159, which remained in hospital for 128 days, was that of a young woman of 17 years of age, and is made the subject of special reference in another part of this report. Prior to this case the longest hospital term was 77 days, which was during 1897, and referred to a young woman of similar age.

Susceptibility as Influenced by Age. Of the 252 cases of true diphtheria the ages were as follows:

	<i>Cases.</i>	<i>Per Cent.</i>
Under 5 years	55	21.8
5 to 10 years	97	38.5
10 to 15 years	37	14.7
Over 15 years	63	25.0

When compared with former statistics the above percentages exhibit a marked difference in the diminished susceptibility of per-

sons under five years of age, and an increased receptivity at other ages, particularly above 15 years. The greater proportion of adolescents and adults admitted to the hospital was frequently the subject of remark, but it was not until the statistics were collated that the fact and its extent became plainly evident. Last year I prepared the statistics of 1,000 cases of diphtheria, which by biological test I had proved to be such. The tabulation of results as to occurrence at various ages gave the following percentages:

Under 5 years	35.4
5 to 10 years	33.4
10 to 15 years	11.3
Over 15 years	19.9

This unusual degree of immunity of children under five years of age is further emphasized by comparison with the figures furnished by other authorities:

1,000 cases cited by Dr. Lennox Brown, England ..	40.3 per cent.
Asylums Board Hospitals, London	37.4 “
1,000 cases Isolation Hospital, Toronto, former years.	35.4 “
252 cases Isolation Hospital, Toronto, 1897-1898...	21.8 “

Mortality as Influenced by Age. Not only has there been a reduced proportion of children of five years and under affected by diphtheria, during the past year, but of those who suffered from the disease a less number died than during the preceding term. Of the thirty fatal cases the ages were as follows:

	CASES.	PER CENT., 1897-8.	PER CENT., 1896-7.
Under 5	16	53.4	62.5
5 to 10	9	30.4	28.1
10 to 15	4	13.3	3.1
Over 15	1	3.3	6.2

Susceptibility as Influenced by Sex. The proportion of hospital admissions was, for males, 43.83 per cent.; for females, 56.17 per cent. These figures do not differ materially from those of former years, and confirm previous conclusions that females are rather more susceptible, or more exposed, probably the latter.

Mortality as Influenced by Sex. Of the fatal cases there were 14 males and 16 females, respectively, 46.7 and 53.3 per cent. Last year the males predominated, the percentages being 62.5 and 37.5.

Hospital Mortality. This may be calculated in various ways: Gross hospital mortality—Of the 324 patients admitted as suffering from clinically diagnosed diphtheria there were 30 deaths, or 9.25 per cent. Net hospital mortality—Of the 30 deaths there were six cases in which the patients were moribund when admitted, and died within 24 hours. One of these expired in the conveyance in which he was being brought to the hospital, and the others in 3, 7, 9, 12 and 22 hours respectively. It is very evident that these cases were not influenced by hospital treatment, and, in accordance with the usual practice, must be excluded from hospital statistics. The net mortality will thus be 8.0 per cent.

Gross Mortality in True Diphtheria. Of the 324 admissions there were only 252 which were true diphtheria. Of these 30 died, equalling 11.5 per cent.

Net Hospital Mortality in True Diphtheria. If, from the above figures are deducted the six moribund cases, the net mortality is shown to be 9.75 per cent. Any comparison as to hospital results between this and any other institution, or mode of treatment, should be based on this corrected figure.

Virulence of Disease. When tested by mortality the virulence of the disease, prevalent during the year, shows a marked decline. Thus, since the establishment of the Isolation Hospital in 1891, and up to last year, the gross mortality was 17.04 per cent. In this calculation there is no allowance for moribund cases, nor for negative cases, as determined by bacteriological test, the proportion simply representing deaths to admissions. If last year's returns be taken in the same way the percentage is 9.25, a reduction of nearly one-half. The gross death rates of the individual years show the variation by which this result has been brought about:

1893.....	19.32 per cent.	1896.....	14.55 per cent.
1894.....	14.05 "	1897.....	16.35 "
1895.....	15.38 "	1898.....	9.25 "

It was, therefore, between 1897 and 1898 that the decline took place, and it was at this time that the disease became less frequent in the case of young children, and more frequent in adults. Possibly these facts are related, but, in any case, for 1898, it may be assumed that the disease was less fatal than formerly, and that adults were more liable to attack.

SOME OBSERVATIONS ON INFECTIOUS DISEASES IN CITY SCHOOLS.

The object of the present enquiry was mainly that of obtaining material for a study of school influence as a factor in the dissemination of infectious diseases, and also of attempting to determine the individual relationships of each school towards various existing sanitary conditions, as location, heating, ventilation, and excreta disposal.

In order to lay a foundation for this work the available statistics were consulted as to the number of cases of infectious diseases which have occurred among school attendants, since the autumn opening in 1894, until the closing, in June 1898, the period for which such records have been preserved, and which practically covers four school years.

It may be explained that, under the Health Act, every physician attending a case of infectious disease, or any householder in whose domicile such disease occurs, is compelled to report such fact to the Health authorities, within twenty-four hours. They, in turn, notify the School Board, and in this way the record is completed. The teachers of the various schools are also supposed to keep a watchful eye on their charges, and, in case of absence, to make enquiries, which often result in the discovery of cases of infectious diseases. It may, therefore, be assumed that, for children attending school, the register of infectious diseases, including typhoid fever, scarlet fever, and diphtheria, is reasonably complete.

Average school attendance has been compiled from the statistics furnished by the Annual Report of the City School Board for 1897, and from figures given by the Secretary of the Separate School Board, and for comparative purposes will fairly represent the period covered by this investigation. In those schools which have outside branches the attendance has been kept separate.

INFLUENCE OF MODES OF HEATING AND VENTILATION.

The statistics thus furnished have been arranged in tabular form so as to show the average attendance, the number of cases of infectious disease during the four years, and the general percentage of such cases on the average attendance. The groupings under headings refer to sanitary conditions and are self-explanatory:

PUBLIC SCHOOLS WHICH ARE HEATED BY THE SMEAD-DOWD SYSTEM.

	Average atten- dance.	Cases infectious disease.	Percentage infectious disease.
Borden	552	27	4.8
Brant	350	23	6.5
Brock.....	355	28	7.9
Church	554	44	7.9
Clinton	382	18	4.7
Cottingham	266	34	12.7
Crawford	341	26	7.6
Dewson	607	39	6.4
Dovercourt	384	16	4.1
Duke.....	310	15	4.8
Fern	397	18	4.7
George.....	337	21	6.2
Givens.....	812	43	5.2
Gladstone	682	42	6.1
Grace	423	37	8.7
Hamilton	362	30	8.3
Huron	598	89	14.8
Jesse Ketchum.....	744	64	8.4
John	398	26	6.5
Lansdowne.....	835	86	10.3
Leslie.....	285	21	7.4
McCaul	530	45	8.4
Manning	498	14	2.8
Morse.....	597	37	6.2
Niagara.....	400	21	5.2
Palmerston	566	39	6.8
Park	814	60	7.3
Perth	176	5	2.8
Phœbe	583	25	4.2
Queen Victoria.....	633	21	3.3
Rose	511	34	6.6
Rosedale	164	14	8.5
Sackville	332	14	4.2
Shirley	237	9	3.7
Wellesley	836	58	6.9
	16,851	1,143	6.79

PUBLIC SCHOOLS IN WHICH WOOD OR COAL STOVES ARE USED.

	Average atten- dance.	Cases infectious disease.	Percentage infectious disease.
Bathurst	395	22	5.5
Elizabeth	153	25	16.3
Howard	25	2	8.0
Island.....	20	0	0.0
Louisa	378	28	7.5
Parliament.....	204	5	2.4
Winchester	404	24	5.9
York	88	2	2.2
	1,662	108	6.49

PUBLIC SCHOOLS IN WHICH STEAM HEATING IS EMPLOYED.

	Average atten- dance.	Cases infectious disease.	Percentage infectious disease.
Bolton	758	30	3.9
Dufferin.....	972	54	5.5
Parkdale.....	634	25	3.9
Ryerson.....	980	27	2.7
Victoria	467	33	7.0
	3,811	169	4.43

SEPARATE SCHOOLS IN WHICH HOT-AIR FURNACES ARE USED, INCLUDING THOSE OF THE SMEAD-DOWD SYSTEM.

	Average atten- dance.	Cases infectious disease.	Percentage infectious disease.
St. Ann's... ..	78	3	3.8
St. Patrick's.....	348	14	4.0
St. Peter's.....	110	5	3.6
Sacred Heart.....	90	2	2.2
St. Helen's (S-D partly).....	296	5	1.6
St. John's (S-D)	87	0	0.0
St. Mary's (S-D partly).....	557	24	4.3
	1,566	53	3.38

SEPARATE SCHOOLS IN WHICH COAL OR WOOD STOVES ARE USED.

	Average atten- dance.	Cases infectious disease.	Percentage infectious disease.
St. Basil's.....	142	3	2.1
St. Cecilia's.....	88	0	0.0
St. Francis'	199	5	2.5
St. Joseph's	83	1	1.2
St. Michael's.....	240	1	0.4
St. Paul's	547	7	1.2
	<u>1,299</u>	<u>17</u>	<u>1.30</u>

SUMMARY OF RESULTS AS TO HEATING.

Public Schools.	Average atten- dance.	Cases infectious disease.	Percentage infectious disease.
Smead-Dowd System.....	16,851	1,143	6.79
Wood or Coal Stoves.....	1,662	108	6.49
Steam Heating	3,811	169	4.43
	<u>22,324</u>	<u>1,420</u>	<u>6.35</u>
Separate Schools.			
Mixed heating—			
Hot-air, Smead-Dowd and Steam	1,566	53	3.38
Coal or wood stoves.....	1,299	17	1.30
	<u>2,865</u>	<u>70</u>	<u>2.44</u>

A scrutiny of the preceding figures reveals several prominent facts, the most notable being that relating to the difference in the occurrence of infectious diseases in Public and Separate Schools. The summary of results shows that in the Public Schools the general percentage of cases was 6.35, while in the Separate Schools it was 2.44. This disparity cannot be resolved by reference to peculiar modes of heating, as in all cases the Public Schools show higher percentages. It is, therefore, evident that an explanation must be sought from the operation of conditions other than those relating to heating, and which may possibly be revealed during further investigation.

Another very evident fact deducible from the Public School figures is that there has been much less infectious disease in schools

with steam heating than in those in which the Smead-Dowd system is operated, or even in those which are heated by stoves.

The Separate School records do not afford a means of making a similar comparison, as nearly half the schools are heated by coal stoves, part of the balance by ordinary hot air furnaces; and, in the remainder, the heating is of a mixed character, being partly by the Smead-Dowd system, hot water and coal stoves. The only school operated solely under the Smead-Dowd system is that of St. John, but in this the attendance, 87, is too small to afford a basis for calculation. There was not, however, in this school any infectious disease. As far as the Separate School figures go the institutions heated by coal stoves are presented in a far more favorable light than those in which any other mode is in use.

INFLUENCE OF MODES OF EXCRETA DISPOSAL.

The heating of a school has much to do with its ventilation, and in some systems, dominates it entirely. In this connection the figures which have been presented have an important bearing on school hygiene, but are, perhaps, secondary to those relating to the system of excreta collection, and which are herewith tabulated:

PUBLIC SCHOOLS IN WHICH THERE ARE DRY (CONSERVANCY) CLOSETS WITH SMEAD-DOWD VENTILATION. (*In Schools marked by an asterisk part of the closets are operated by water.*)

	Average atten- dance.	Cases contagious disease.	Average contagious disease.
Brant.....	350	23	6.5
Church.....	554	44	7.9
Cottingham	266	34	12.7
Crawford	341	26	7.6
Dovercourt	384	16	4.1
George	337	21	6.2
*Hamilton.....	362	30	8.3
Huron	598	89	14.8
Leslie	285	21	7.4
McCaul	530	45	8.4
Perth	176	5	2.8
*Phoebe.....	583	25	4.2
Sackville	332	14	4.2
	5,098	393	7.31

PUBLIC SCHOOLS IN WHICH THERE ARE WATER CLOSETS WITH SMEAD-
DOWD VENTILATION.

	Average atten- dance.	Cases contagious disease.	Average contagious disease.
Borden	552	27	4.8
Brock.....	355	28	7.9
Clinton	382	18	4.7
Dewson	607	39	6.4
Duke.....	310	15	4.8
Fern.....	397	18	4.7
Gladstone.....	682	42	6.1
Grace.....	423	37	8.7
*Hamilton.....	362	30	8.3
Jesse Ketchum.....	744	64	8.4
John	398	26	6.5
Lansdowne	835	86	10.3
Morse.....	597	37	6.2
Palmerston	566	39	6.8
Park	814	60	7.3
*Phœbe	583	25	4.2
Queen Victoria...	633	21	3.3
Rose	511	34	6.6
Rosedale.....	164	14	8.5
	9915	660	6.65

PUBLIC SCHOOLS WITH OUTSIDE CLOSETS. (*Cesspits in cases of those
marked with asterisks ; otherwise water closets.*)

	Average atten- dance.	Cases contagious disease.	Average contagious disease.
Bathurst	395	22	5.5
Elizabeth	153	25	16.3
*Howard	25	2	8.0
*Island	20	0	0.0
Louisa	373	28	7.5
Manning	498	14	2.8
Niagara	400	21	5.2
Parliament	204	5	2.4
Wellesley	336	58	6.9
Winchester	404	24	5.9
York	88	2	2.2
	3,396	201	5.91

PUBLIC SCHOOLS IN WHICH THERE ARE WATER CLOSETS WITH SEPARATE VENTILATION.

	Average atten- dance.	Cases contagious disease.	Average contagious disease.
Bolton	758	30	3.9
Dufferin.....	972	54	5.5
Givens.....	812	43	5.2
Parkdale	634	25	3.9
Ryerson.....	980	27	2.7
Shirley	237	9	3.7
Victoria	467	33	7.0
	<u>4,860</u>	<u>221</u>	<u>4.54</u>

SEPARATE SCHOOLS WITH OUTSIDE CESSPITS.

	Average atten- dance.	Cases contagious disease.	Average contagious disease.
St. Basil's.....	142	3	2.1
St. Cecilia's	88	0	0.0
St. Francis'	199	5	2.5
St. Joseph's	83	1	1.2
St. Michael's.....	240	1	0.4
	<u>752</u>	<u>10</u>	<u>1.33</u>

SEPARATE SCHOOLS WITH WATER CLOSETS WITH SEPARATE VENTILATION.

	Average atten- dance.	Cases contagious disease.	Average contagious disease.
St. Ann's	78	3	3.8
St. Patrick's.....	348	14	4.0
St. Peter's.....	110	5	3.6
St. Paul's	547	7	1.2
Sacred Heart	90	2	2.2
	<u>1,173</u>	<u>31</u>	<u>2.64</u>

SEPARATE SCHOOLS WITH CLOSETS OF A MIXED CLASS, MOSTLY SMEAD-DOWD VENTILATION.

	Average atten- dance.	Cases contagious disease.	Average contagious disease.
St. John's (Smead-Dowd).....	87	0	0.0
St. Helen's (Partly S-D).....	296	5	1.6
St. Mary's "	557	24	4.3
	940	29	3.08

SUMMARY OF RESULTS AS TO EXCRETA COLLECTION.

Public Schools.

	Atten- dance.	Cases contagious disease.	Percentage contagious disease.
Dry closets, S-D Ventilation...	5,098	393	7.31
Water closets, " " ...	9,915	660	6.65
" Outside Sch'l Bldgs.	3,396	201	5.91
" Separate Ventilation	4,860	221	4.54

Separate Schools.

Mixed Systems—

Mostly S-D Ventilation.....	940	29	3.08
Water closets, Separate Vent..	1,173	31	2.64
Privy Pits, outside sch'l bldgs..	752	10	1.33

Combined Schools.

Outside water closets, or privy pots	4,148	211	4.12
Water closets, with Sep. Vent...	6,124	252	4.11
Water and dry closets mostly with S-D Ventilation.....	15,866	1,082	6.81

A glance at this summary of results shows, of course, the same general difference between the Public and Separate Schools, as in the case of modes of heating, and an analysis of the figures reveals the fact that this difference cannot be wholly accounted for by reference to the systems of closets in use. There is not much opportunity for comparing the Smead-Dowd System, either water carriage or conservancy, in the two classes of schools, as while this mode of closet

ventilation prevails in thirty of the Public Schools it is only found in three Separate Schools—St. John's, St. Helen's and St. Mary's, and in only one of these—St. John's—is it alone used. In St. Helen's there are two buildings, one with cesspits, and the more recent with dry Smead-Dowd closets; while in the three buildings which comprise St. Mary's school, one has flush closets, with separate ventilation, and the children of the other buildings use the dry Smead-Dowd closets, which are located in one of the basements. In the early records of infectious diseases in these schools it is impossible to say in which of the buildings the cases occurred, and, consequently, there is no other course than that of putting these schools in a mixed class, in which, however, the Smead-Dowd system prevails.

Taking the figures presented in the summary it is evident that no matter how the Public or Separate School statistics are compared the result is always in favor of the latter. In no way is this more strikingly exemplified than by placing side by side the figures relating to the outside privies of the Separate Schools with the outside latrines of the Public Schools—the proportional percentages are respectively as 1.33 : 5.91. Less in degree, but similar, are the figures relating to separately ventilated closets, being 2.46 for Separate and 4.54 for Public Schools. The Smead-Dowd system, as far as comparable, reveal the same state of things. In view of these facts the deduction seems justifiable that though the greater healthfulness of Separate School children may to some extent be accounted for by the mode of excreta collection being favorably affected by the larger proportion of outside and separately ventilated closets or privy pits, the explanation must, in great part, be sought in other conditions, which so far, have not been revealed by this investigation.

Little need be said as to a comparison of the various kinds of closets in the Public Schools. The figures in the summary of results tell their own story, and show more plainly than can be expressed in words the relationships of excreta collection to infectious disease. It goes without saying that outside closets, or those with separate ventilation, are much preferable to either those of the wet or dry systems in which there is a possibility of the ventilation being complicated with that of the school generally.

A glance down the percentage column of the summary, as far as the end of that part relating to Separate Schools, shows a very sur-

prising sequence of figures; commencing with 7.31 and ending with 1.33. This means that of every 100 scholars who, during four years, have attended Public Schools having dry closets, with Smead-Dowd ventilation, seven and one-third have been the subjects of infectious disease, which, in the Separate Schools, with outside privy pits, only one and a third have been so affected. This is certainly somewhat of a reflection on so-called modern sanitation, and shows that without both principles and appliances are perfect the old-fashioned notion of keeping fecal matter outside and as far away from the house as possible is practically safer than storing it within doors, and trying to minimize its dangers by desiccation, disinfection or ventilation.

In order to utilize as much evidence as is available I have taken advantage of the record of scarlet fever cases occurring among pupils of the city schools from last September opening until the date of writing. There have been, in all, 316 cases in the Public Schools, and 13 cases in the Separate Schools. This at once furnishes additional confirmation of the fact noticed throughout with regard to the comparative frequency of infectious diseases, and, in this case, affords a special indication in regard to a particular disease. The relations of the schools are as follows, and require no comment:

	Attendance.	Cases.	Percentage.
Public Schools	22,324	316	1.41
Separate Schools	2,865	13	0.45

A classification of these scarlet fever cases has been made on the basis adopted for the other infectious diseases. A repetition of previous figures is unnecessary, and I have, therefore, only presented the totals in the various classes:

Public Schools.

Water closets, Smead-Dowd ventilation.	152	1.69
Dry closets " "	75	1.47
Water closets, separate ventilation	69	1.41
Water closets, outside buildings	20	0.58
	22,324	316 1.41

Separate Schools.

	Attendance.	Cases.	Percent.
Mixed systems, partly Smead-Dowd ventilation		8	0.85
Privy pits or water closets; outside buildings		3	0.39
Water closets; separate ventilation		2	0.17
	2,865	13	0.45

Here, as before, the Public Schools with Smead-Dowd wet or dry closets show the largest percentages of disease, but while infectious diseases generally were most prevalent in schools with dry closets, scarlet fever was rather more frequent in schools with water closets of the Smead-Dowd system, and closets with separate ventilation do not show up in as favorable a light as they did in regard to general infectious diseases. Public Schools, with outside closets, have escaped very lightly.

In the Separate Schools the Smead-Dowd and mixed class are, as before, at the head of the list, but closets with separate ventilation were not so much affected as those with outside privies, which, for freedom from general infectious diseases, have been shown to occupy the first place.

INFLUENCE OF ELEVATION.

As each school is more or less centrally situated with reference to the district from which pupils are drawn, and as the various parts of the city are not credited with uniform salubrity, it seems probable that a comparison of school localities may throw some light on the subject under investigation.

The city is built on land gradually rising northward, until on the line of the C. P. R. the elevation is about 160 feet above the level of the lake. The slope, especially on the lower levels, is not uniformly parallel with streets running east and west, but is greatest towards the west, and is intersected by the hollows of the original creeks by which the drainage of the area was formerly effected. The western part of the land was drained by the Garrison Creek, which took its origin northward, beyond the present limits, and in line with Ossington Avenue. A branch, near Crawford Street, at about its

intersection with Givens Street, extended north-west, above Bloor Street, to near the limits. The central part of the city was drained by the creek originating in the high land near the head of Howland Avenue, thence through the University grounds to near Caer Howell Street, and thence south-east to Queen Street, near Bond, and almost parallel with Queen Street to near Sherbourne Street, and south-east to its discharge, near the foot of Parliament Street. The Rosedale district, as well as that above Yorkville Avenue, on Yonge Street, drained into the Rosedale Creek, of which the course is still sufficiently evident, as also that of the Don River. The land east of that watercourse was cut up by creeks running south, the principal being that which originated near the corner of Hogarth and Broadview Avenues, and which emptied at the foot of Pape Avenue. Another took its origin near the head of the last named thoroughfare and discharged near Leslie Street. Several others, running nearly south, drained the land from this point to what is now the extreme easterly limit of the city.

These watercourses are now represented by filled-in land, in the built-up parts of the city, and, in others, by low land or ravines. In a close study of individual school districts these conditions must be taken into account. It will, however, be sufficient, for the immediate purpose of this enquiry, to take the city area as having a more or less uniform slope, and this assumption is in a general sense correct.

A line drawn from the east, almost parallel with Gerrard, to Yonge Street, thence falling to Queen, at Bathurst Street, and again rising westward will enclose elevations of from 10 to 60 feet.

Between this line, and nearly as far north as Bloor Street, the elevation will be from 60 to 120 feet. A third line along the south side of the C. P. R. track from Summerhill Avenue to the extreme western part of the city will give an elevation of about 160 feet along the northern limits. That part of the city east of the Don River comes nearly within the 120-foot level.

The city can in this way be divided into three transverse belts, representing respective elevations of from 10 to 60, 60 to 120, and 120 to 160 feet; approximately bounded by Gerrard, Bloor and Dupont Streets. These divisions have been adopted for a classification of schools as to elevation, and give rise to the following tabulation:

Elevations of City Schools.

10 to 60 feet.

Public Schools—Leslie, Morse, Bolton, Hamilton, Park, Sackville, Dufferin, Parliament, Duke, George, Victoria, Louisa, York, John, Phœbe, Brant, Niagara, Manning, Crawford, Givens, Queen Victoria. (21)

Separate Schools—St. Joseph's, St. Ann's, St. Paul's, Sacred Heart, St. Michael's, St. Mary's. (6)

60 to 120 feet.

Public Schools—Winchester, Church, Wellesley, Elizabeth, McCaul, Ryerson, Bathurst, Lansdowne, Clinton, Grace, Dewson, Brock, Shirley, Gladstone, Parkdale, Fern. (16)

Separate Schools—St. John's, St. Basil's, St. Francis', St. Helen's. (4)

120 to 160 feet.

Public Schools—Rose, Rosedale, Jesse Ketchum, Cottingham, Huron, Borden, Palmerston, Dovercourt, Perth, Howard. (10.)

Separate Schools—St. Peter's, St. Cecilia's. (2)

OCCURRENCE OF INFECTIOUS DISEASES IN SCHOOLS AT VARIOUS ELEVATIONS.

	<i>Public Schools.</i>			<i>Separate Schools.</i>		
	Atten- dance.	Cases.	Percent- age.	Atten- dance.	Cases.	Percent- age.
10 to 60 ft.	9,914	549	5.53	1,595	38	2.39
60 to 120 ft.	8,404	547	6.50	1,072	27	2.51
120 to 160 ft.	3,986	324	8.12	198	5	2.52

If the cases of scarlet fever before referred to, and which have occurred during part of the current school term, be treated on the basis of the above table, the following arrangement of percentages is presented:—

	<i>Public Schools.</i>			<i>Separate Schools.</i>		
	Atten- dance.	Cases.	Percent- age.	Atten- dance.	Cases.	Percent- age.
10 to 60 ft	9,914	90	0.90	1,595	6	0.37
60 to 120 ft.	8,404	120	1.42	1,072	6	0.55
120 to 160 ft.	3,986	106	2.65	198	1	0.50

The difference between Public and Separate Schools is here marked very strongly, both with regard to infectious diseases generally, and to scarlet fever, particularly on the high levels. On the sixty-foot belt the percentage of infectious disease cases, and also that of scarlet fever, is about two and one-third times more in the case of Public than of Separate Schools, on the middle belt the proportion rises to about two and a half for infectious diseases, and two and three-quarters for scarlet fever, and on the high belt, from 120 to 160 feet, to about three and a quarter times for infectious diseases and five and a quarter for scarlet fever. These are most remarkable figures, and not easily accounted for.

Another very noticeable fact, which in this connection is very apparent, is, that while in the Public Schools the number of cases of disease increases with the elevation it remains almost stationary in the Separate Schools. There is a very slight increase in respect to infectious diseases in the latter, while in the former, there are about five cases per 100 in the lowest belt, to eight in the highest.

Scarlet fever, in the Public Schools, also shows a great increase, amounting to nearly three times as many cases on the highest than the lowest levels, while in the Separate Schools the increase from the first to the second belt is less than one-fifth of a case, followed by an actual drop, though very slight, at the highest elevation. The number of pupils attending school on that area is, however, perhaps too small to afford a reliable datum for comparison.

Taking the condition broadly, it may be said that in one class of schools at all elevations, there is nearly the same proportion of cases of infectious disease, while in the other there is a steady and rapid increase as the land rises. The solution of this problem has not so far been afforded by the results of this enquiry.

It may be profitable to consider this subject of elevation in connection with that of excreta disposal, as it has previously been shown

that the prevalence of disease appears to be closely related to this condition. The fact was established that in schools with either the conservancy or water-carriage systems, with ventilation in any way connected with that of the school generally, the greatest proportion of infectious disease was noticable.

It, therefore, becomes interesting to ascertain whether in the schools of the higher parts of the city, where infectious disease is most frequent, there is a preponderance of closets of this class. If so, this would afford a possible explanation of the peculiarity remarked, and, I may say that such is the case, as will appear from the subjoined figures, but I do not think that this will wholly account for the fact, as a prevalence of infectious disease in the higher part of the city, and independent of school influence, can, I think, be established.

A classification of the Public Schools, on the highest and lowest levels, and according to the system of excreta disposal pursued, gives the following results: (The attendance at Hamilton Street and Phoebe Street schools, which have both wet and dry closets, has been divided equally between each system.)

Elevation under 60 feet.

Conservancy closets, Smead-Dowd ventilation	2,118
Water-carriage closets, Smead-Dowd ventilation	2,914
“ “ separate ventilation....	2,251
Outside closets	2,631

By adding together the attendance of the schools with dry and wet Smead-Dowd closets, the total is 5,032. Nearly one-half (49.3 per cent.) of these schools have, therefore, closets with separate ventilation, or entirely outside the school.

Elevation over 120 feet.

Conservancy closets, Smead-Dowd ventilation	1,424
Water-carriage closets, Smead-Dowd ventilation	2,537
Outside closets	25

These are practically schools with Smead-Dowd ventilation (99.4 per cent.), the only exception being the Howard Street school, in which there are outside cess-pits.

From the above it seems evident that the frequency of disease at the highest level belt may to some extent be due by the peculiarity of closet ventilation.

INFLUENCE OF NEIGHBORHOOD.

The division of the city into transverse belts, of equal elevation, does not convey much of an idea as to neighborhood, which, in the case of schools, to some extent implies social condition. Such influences are exterior to schools, and do not rightly belong to the precise subject under enquiry. The question might, however, be relevantly asked whether, in the case of Public and Separate Schools, the difference in disease occurrence is not to a great extent a result of the social position of the pupils residing in the neighborhood. In order to throw some light on this question I have presented, in parallel columns, the statistics of the two classes of schools, located in the same neighborhoods. Such schools are often in the same blocks, and as a general rule overlap more or less completely the same limits. In the other cases the comparison has been made with careful reference to the map of school limits, and, in any event, is subject to the criticism of those who may have a better personal acquaintance with the individual localities than has the writer.

OCCURRENCE OF INFECTIOUS DISEASES IN PUBLIC AND SEPARATE SCHOOLS LOCATED IN THE SAME NEIGHBORHOOD.

	Attendance.	Cases.	Percentage
Leslie St.....(P)	285	21	7.4
St. Joseph's .....(S)	83	1	1.2
Hamilton St.....(P)	362	30	8.3
St. Ann's .....(S)	78	3	3.8
Park .....(P)	814	60	7.3
St. Paul's .....(S)	547	7	1.2
Sackville St .....(P)	332	14	4.2
Sacred Heart.....(S)	90	2	2.2
Winchester St. ....(P)	404	24	5.9
St. John's .....(S)	87	0	0.0
Duke St.....(P)	310	15	4.8
St. Michael's .....(S)	240	1	0.4

INFECTIOUS DISEASES—*Continued.*

	Attendance.	Cases.	Percentage.
McCaul St.....(P)	530	45	8.4
St. Patrick's .....(S)	348	14	4.0
Niagara St.....(P)	400	21	5.2
St. Mary's .....(S)	557	24	4.3
Grace St.....(P)	423	37	8.7
St. Francis.....(S)	199	5	2.5
Shirley St.....(P)	237	9	3.7
St. Helen's.....(S)	296	5	1.6
Borden St.....(P)	552	27	4.8
St. Peter's .....(S)	110	5	3.6
Wellesley St.....(P)	536	58	6.9
St. Basil's .....(S)	142	3	2.1
Perth Avenue.....(P)	176	5	2.8
St. Cecilia's .....(S)	88	0	0.0

From the above tabulation it is evident that the difference between the classes of schools is not to be accounted for by reference to neighborhood. Every individual group tells the same story, and in some cases in which the schools are almost side by side, as Leslie and St. Joseph's, Park and St. Paul's, Duke and St. Michael's, and McCaul and St. Patrick's, a comparison of the percentage figures is very striking.

INFLUENCE OF OVERCROWDING.

When the class-rooms of a school do not conform to the regulation requiring 250 cubic feet of air space per pupil, with a floor area of 16 square feet each, such room is considered to be overcrowded. To ascertain these particulars with regard to the existing school accommodation would require a thorough inspection, and the expenditure of much more time in making the necessary measurements and calculations than are at the disposal of the writer. It may, however, be presumed that in providing seats the School Board kept the above restrictions in view, and that every class room would therefore be within the proper limits. If so, any evidence of overcrowding would be shown by comparing the average attendance with the number of seats.

An inspection of the published school statistics shows that in only three schools—Bolton Avenue, Dufferin and Gladstone Avenue—was the attendance in excess of the seating capacity. In these schools, with an average attendance of 2,412, there was a deficiency of 171 seats. In all the other schools there was an excess in this respect, the total average number of unoccupied seats being 2,611.

If the three schools mentioned may on this evidence be taken as overcrowded such condition does not seem to have affected the percentages of disease, which were, respectively, 8.9; 5.5; and 6.1 with an aggregate average of 5.2. All these figures are below the general average percentage—6.35—for all Public Schools.

I have personally inspected many of these schools, and in company with the Health Officer, visited all those which have branches, or supplementary rooms. Evidence of overcrowding in these schools was not often noticeable, and never to any very great extent. From the opportunities for personal observation which I have had, and judging from the general proportion of seats to attendance, I do not think that in this respect much objection could be taken to the Public Schools, and am of opinion that any excess of infectious disease cannot be rightfully ascribed to this source.

AGE OF SCHOOL BUILDINGS.

The age of a school building is in itself of minor importance but is suggestive of dirt, and perhaps of germ accumulation, and reflects more or less the condition of sanitary science at the time when the building was erected. The older schools were originally constructed when opportunities were generally restricted by conditions of economy and when heating, ventilation, excreta disposal and drainage were managed on first principles. The old time schoolhouse was heated by a stove placed directly within it; ventilated by doors and windows in direct communication with the open air; drained, if at all, by an outside conduit, and furnished with a privy as far as possible removed from the school building.

It is now difficult to find a Public School of this kind in Toronto. Some of the old features, as heating by stoves, occasionally survive, but only in two—the Island and Howard Street—are privy pits to be found. There are seven schools which were erected between

1850 and 1860 but all these have been to some extent modernized so that the original features are more or less obscured. I append the disease rate for these, together with that of a rather later group, and also of schools of the most modern type.

	Attend- ance.	Cases.	Percent- age.
7 schools erected between 1852 and 1859....	4,191	279	5.1
8 " " 1860 and 1875....	2,853	235	8.0
6 " " 1890 and 1897....	2,580	230	9.0

These comparative percentages are interesting, but are not, of course, the result of the effect of old age, but of other causes already considered.

I have taken up as fully as time has permitted the main factors which have occurred to me as most likely to influence the frequency of infectious diseases. There are others, of a minor character, some of which relate to the interior working of schools, and, for a closer study would have been taken into account. Some of these relate to school work; duration of time of study; closeness of application; difficulty of tasks, and such like influences, which would be likely to cause excessive nervous or mental tension, thus diminishing the disease resisting power of the pupil. These matters have, doubtless, been thoroughly considered by the school authorities, and though the wind may not have been exactly tempered to the shorn lamb, it is probably such as can be borne by the average members of the flock. At any rate it may be presumed that in city schools these matters have been made uniform, so that the pursuit of knowledge is carried on in all at the same speed and under the same conditions.

The transmission of contagious diseases need not be direct, from pupil to pupil, but may take place through ectanthropic substances. Diphtheria and scarlet fever are liable to be conveyed in this way; hence it will be seen that the mode of temporary disposal of pupils' clothing, the interchange of books, desks, pencils, kindergarten appliances, and such like may be the medium of pathogenesis. I am not now in a position to say whether in the Public Schools the arrangements as to these matters are always the same, or whether such schools differ from Separate Schools in this respect, but all such points, as well as that relating to racial differences in pupils, demand enquiry before a final conclusion can be reached.

The work so far accomplished has been of a preliminary character, and more for the purpose of collecting and classifying evidence for future study, than for any exercise of judgment thereon. Several facts have, however, forced themselves so prominently forward that conclusions seem to have been anticipated. It is not now my intention to emphasize these but rather to leave the whole subject open to criticism, correction and discussion, so that its weak points may be discovered and a sound foundation presented for the completion of a very necessary work.

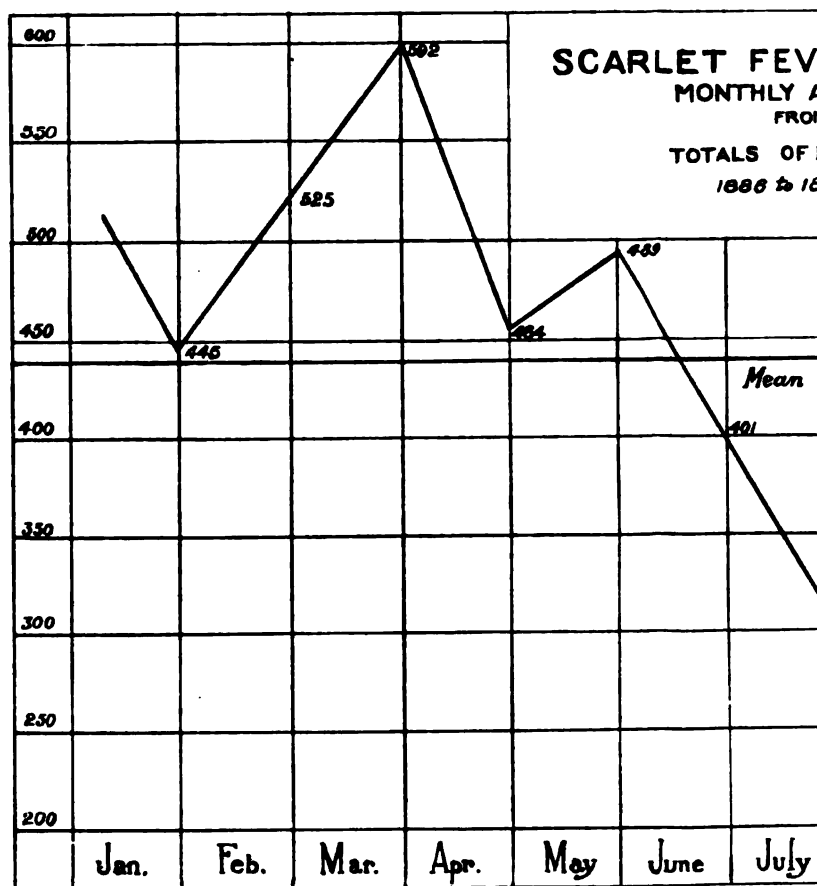
SEASONAL PREVALENCE OF SCARLET FEVER IN TORONTO.

The official records of cases of scarlet fever reported in Toronto, during the past thirteen years, from 1886 to 1898, inclusive, afford tolerably sufficient data for ascertaining whether there is any periodicity attached to the disease in this locality, and if so, of determining its extent, as estimated by months or seasons.

The register includes, for the period stated, a total of 5,307 cases. These have been classified according to months, and are plotted in the diagram appended, from which the course of the disease through the average of past years can be clearly traced, and a possible forecast made as to the future.

The infection of scarlet fever is never entirely absent from the city, as there has not been a month without the report of at least one case. The disease reaches its average lowest point in August, from which there is a sharp rise to November, followed by a depression in January, and a rise in March, from which the decline to August is only broken by a slight elevation in May. If these minor fluctuations be disregarded, and a point of view be selected from the maximum depression of August, there are, on either hand, two great waves, one stretching backward for five months to March, the other extending forwards for three months to November, and between the crests of these waves there is a midwinter trough, not half as deep as that in midsummer, but reaching its lowest point in January.

A mean line has been drawn in the diagram, so as to represent the average number of cases—442—per month, as obtained by dividing the total cases by 12. It will be noticed that from about the middle of June until the beginning of November the curve is below that line, and for the balance of the year above it, but nearly touching in January.



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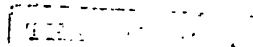
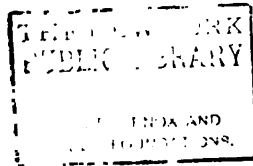
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English statistics, as furnished by the Registrar-General's returns from 1860 to 1896, and also those of the Metropolitan Asylums Board Hospitals of London, are summarized by F. Foord Caiger, in the recent compilation of Clifford Allbutt, in which it is shown that, in England, scarlet fever is least prevalent in March and April, after which a slow and steady rise takes place, until the mean is passed, at some time during the month of August. A rapid extension of the disease occurs in September and October, usually reaching its climax during the last week of the latter month. From the beginning of November the curve shows a steady decline, dropping more rapidly in December until the mean is reached again towards the close of the month or the beginning of January.

It will thus be seen that between England and Canada, as represented by Toronto, there is a very marked seasonal difference. This is most apparent in March, which in England is the month when the disease is least prevalent, while here it is at one of its highest points, the other being reached about November, a few weeks later than in England. Speaking generally there is but one marked annual wave in England, with the crest in the latter part of October, while in Canada we have two waves, one which culminates in November and the other—somewhat lower—in March.

According to P. Gervais Robinson, in the recent work of Loomis-Thompson, scarlet fever in the United States is distributed throughout the seasons with more uniformity than has been observed in some other countries, yet the preponderancy of cases in autumn and winter is preserved. In explanation of this it is said that at these seasons the surface of the body is more liable to be chilled, especially among the poor, and food is more likely to be insufficient. Throat lesions are then more prevalent, and the respiratory mucous membrane, by which it is supposed infection is received, is thus less resistant. It is also at this time of the year that there is additional opportunity for personal contact among school children, and this is considered a potent factor in the dissemination of the disease.

It is not at this time the intention to attempt any speculations as to the causes of periodicity, but simply to take advantage of the accumulation of evidence as proving seasonal prevalence and the extent of its influence in Toronto.

INFLUENCE OF STREET PAVEMENTS ON THE OCCURRENCE OF DIPHTHERIA.*

Of late years there has arisen a prejudice against cedar block pavements, and the opinion has gradually gained ground, both amongst the laity and medical profession, that such wooden roadways tend to the propagation and dissemination of disease. This has been frequently asserted with regard to diphtheria, which is claimed to be more prevalent on block-paved streets than on those made of macadam, brick, or asphalt.

It is not the intention of the writer to discuss the reasons which have been adduced in support of the position that block pavements operate as predisponents to diphtheria, or as actual carriers of infection, but rather to ascertain whether this position is based on fact. To this end some preliminary observations have been made, and are herein submitted.

It may be explained that the rapid extension of the limits of the City of Toronto, some eight or ten years ago, necessitated the speedy construction of pavements and cedar blocks were thus largely employed, and are still used. For this purpose, young cedars, from which the bark has been removed, are cut into six-inch lengths, and are laid on end, resting on two inches of gravel, the interstices between the blocks being filled with the same material.

In making a selection of streets for observation the localities chosen were as nearly as possibly alike as to drainage, elevation, and density and character of population, but unlike in the matter of pavements. The period covered included five years, from 1892-6 inclusive, and the cases of diphtheria tabulated were those of the official records of the Health Department. About forty miles of streets, mostly cedar-block and macadam, were included in the investigation.

On comparing 14 equal lengths of streets, each running about 2,400 ft. north from Queen Street, and up to and in line with Gerrard Street, it was found that on 7 block-paved streets there had been 106 cases of diphtheria, and precisely the same number on 7 streets paved with macadam. On 14 lengths of streets, about 20 miles in all, running north and south and east and west, and of a distance equal

*Read at the Annual Meeting of the Executive Health Officers of Ontario.

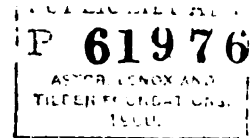
to that between Queen and Bloor Streets, there were 310 cases on block-paved streets, and 317 on those of macadam. *On various short lengths the figures were 25 for block-paved and 32 for macadam streets.

The totals of these give 441 cases for block-pavement, and 455 of macadam—figures which may be regarded as being practically identical.

The macadam portion of old St. John's Ward comprises almost the entire area, and showed 209 cases, against 235 for the old Yorkville district, of which the streets are, with a few exceptions, block-paved. These districts are in some respects alike, but differ in elevation, and character of soil and population, the advantages being with the Yorkville district. Nevertheless, as has been observed by others, dirt and diphtheria do not necessarily go hand-in-hand, and the old and apparently unsanitary ward is in the better position.

If to the previous totals are added the last results they stand at 676 for block-pavement, and 664 for macadam. So far, then, as the present investigation has gone, it appears that if character of pavement has any influence on the occurrence of diphtheria there is no practical difference between macadam and cedar blocks. Observations are being continued, and extended, and will be made the subject of a future paper.

There are not, in Toronto, a sufficient number of residential streets paved with asphalt to justify conclusions as to this kind of roadway, but, as far as noted, it appears to exercise a slightly favorable influence, while unimproved streets—the so-called mud road—may be classed with the others mentioned.



Annual Report



Board of Health



Toronto, Ont.
1899

ANNUAL REPORT

OF THE

Local Board of Health

FOR THE

YEAR 1899.



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ANNUAL REPORT
OF
LOCAL BOARD OF HEALTH
FOR THE YEAR 1899.

To the Chairman and Members of the Local Board of Health:

In compliance with the provisions of the Statute I beg to report to the Board the sanitary work done during the year 1899, also the sanitary condition of the City as shown by the Minute Book in which are recorded the proceedings of the Local Board of Health of this City.

During the year 1899 the Board held several important meetings, and the attendance thereat by the members has been exceptionally good.

ISOLATION HOSPITAL.

The Medical Health Officer having reported that the accommodation at the Isolation Hospital is insufficient to meet the requirements of this City, and that owing to this cause he has been compelled to refuse the admission of cases, fit and proper to be admitted therein, and in which satisfactory isolation could not otherwise be secured, the Board resolved to apply for the necessary legislation to utilize an additional portion of the park so as to enlarge the present building, and having secured the legislation the Board will take steps at an early date to carry out the proposed enlargement.

ESTIMATES.

The estimated expenditure of the Board for 1899, as submitted by the Medical Health Officer, and adopted by the Board, was as follows:

General purposes	\$22,826
Isolation Hospital	14,936
Enlargement of Isolation Hospital	20,000
	\$57,762

While the above estimate showed a large increase over the previous years expenditure, it was explained that the insertion of the money to defray the cost of enlarging the hospital was wholly the cause of the increase.

SMALLPOX HOSPITAL.

The question of removing the Smallpox Hospital was brought up for consideration by the following notice of motion given by Ald. Stewart at a meeting of the City Council, held on the 4th of April, viz.:

“Ald. Stewart gives notice that he will on to-morrow move for leave to bring in a Bill authorizing the removal of the Smallpox Hospital from its present site to some other place where its presence will not be a menace to the public health, and a detriment to the enjoyment by the people of the public parks of the City.”

The Board after giving the matter due consideration decided to insert the sum of \$4,000 in this year's estimates for the erection of a new Smallpox Hospital on a site in the north-west portion of Riverdale Park, the same having been recommended by the Medical Health Officer.

CONSUMPTION HOSPITAL.

The City Council at a meeting held on the 1st May, 1899, considered the following recommendation made by the Board of Control:

“After giving this matter its best consideration, the Board are unanimously of the opinion that the establishment of a Hospital for the treatment of consumptives is now an almost absolute necessity, and without committing the City in any way, to either of the plans outlined by the deputations, who have addressed the Board would recommend that a By-law be submitted at the municipal elections to provide the sum of \$20,000 to assist in this urgent and important work.”

The matter was subsequently referred to the Board of Health for consideration, and the Medical Health Officer was requested to submit a full report thereon for the information of the members.

OUTBREAK OF SCARLET FEVER.

The Medical Health Officer informed the Board in his report for the month of April that on the 24th day of that month the Department found that thirty-eight boys, who arrived by the steamer "Dominion," en route to Toronto, had been exposed to scarlet fever, one of the boys who was affected by the disease having been detained at Quebec. Dr. Bryce, Secretary of the Provincial Board of Health was communicated with and asked to take immediate steps to prevent the boys from coming into the City, and the Medical Health Officer, after conferring with the Chairman (Ald. Crane), and Dr. Bryce, it was decided to operate with the local authorities, and Mr. Leonard of the C. P. R. consented to the stoppage of the train conveying the boys at Leaside Junction. The Medical Health Officer considered this incident indirectly valuable, as affirming the position that it is legally possible to prevent infected persons from crossing the limits of the municipality.

CITY SEWAGE.

In the month of October a petition was presented signed by a number of ratepayers, asking for an investigation into the question of the discharge of sewage into the Harbor, and the matter was referred to the Medical Health Officer for a report thereon.

The report of the Medical Health Officer, which was presented to the Board about one month later, clearly defined the present position of affairs, and the recommendation therein contained for testing the different systems of treating sewage was adopted.

ICE CUTTING.

The cutting of ice is still being carried out under the supervision of the Medical Health Department, and little or no complaint has been made as to the system in vogue for providing the citizens with pure and wholesome ice.

CLEANING THE CITY.

The Medical Health Department had the usual spring inspection of back yards and lanes carried out, and the Street Commis-

sioner's Department had all refuse and rubbish carefully gathered up and destroyed.

This work is done systematically, and with great satisfaction to the public generally.

PLUMBING AND FOOD INSPECTION.

The work of the officials appointed to look after the inspection of food and plumbing, has been done faithfully and to the entire satisfaction of the Board.

SANITARY CONDITION OF THE CITY.

The sanitary condition of the City continues to be first class, and Dr. Sheard and those connected with his department deserve great credit for the care and attention given by them to the duties connected with carrying out the health laws, thereby preventing the spread of disease.

The Medical Health Officer's report, which is connected herewith, gives in detail the work carried out under his supervision during the year.

All of which is respectfully submitted.

Your obedient servant,

JOHN BLEVINS,

City Clerk and Secretary of the Local Board of Health.

Dated Toronto, January, 1900.

REPORT
ON THE
SANITARY CONDITION

OF THE
CITY OF TORONTO

ALSO AN
Account of the Operations of the Board of Health and the
Vital Statistics

FOR THE YEAR 1899

BY
CHARLES SHEARD, M.D.,
Medical Health Officer.

MEMBERS OF LOCAL BOARD OF HEALTH.

THE MAYOR.

ALDERMAN FOSTER.

“ LAMB.

“ RUSSELL.

“ SAUNDERS.

DR. ADAM LYND.

ALDERMAN CRANE, *Chairman.*

CHARLES SHEARD, M.D., *Medical Health Officer.*

JOHN BLEVINS, *Secretary.*

REPORT
ON THE
Sanitary Condition of the City of Toronto
ALSO AN
ACCOUNT OF THE OPERATIONS OF THE BOARD OF
HEALTH AND THE VITAL STATISTICS
FOR THE YEAR 1899.

To the Chairman and Members of the Local Board of Health:

Gentlemen,—I have the honor to submit the Annual Report of the Medical Health Department for the year ending October 31st, 1899.

As the Department receives from time to time numerous enquiries regarding the methods adopted in the control and execution of the various branches of work, I propose in this report to deal somewhat fully with the general management of the Department, and to place in a concise form such details as I consider of value.

The handling of contagious disease by the Health Department of the City of Toronto is directly under the supervision of the Health Officer who receives the daily reports furnished in accordance with the City By-law, and the Public Health Act, and gives such directions as are considered necessary to the various inspectors having charge of the supervising of the quarantine. In a large city many difficulties arise in this connection. We occasionally have cases occurring in a large building, part of which is used for office purposes, and part as dwellings, with but one main entrance. The practice of the Department has been to placard, and to place the notice at the main entrance to such building, acting under the impression that the intention of placarding is that of giving to the public sufficient notice of the existence of contagious disease, in order that they may keep away. Difficulties sometimes arise when living apartments are occupied over stores, with the sole entrance through the stores. A placard on the front door of a gent's furnishings or dry goods store, for example, bearing the words — "Scarlet Fever

Here"—practically means a suspension of business for a shorter or longer period of time. The City of Toronto in the past has been fortunate in being able to offer the alternative of having the case removed to a suitable and properly equipped Isolation Hospital. When this is done the house is disinfected, but is not placarded. Should this case be retained the placard must be used, and during recent years every reported case of Diphtheria and Scarlet Fever so existing in a dwelling house has been made subject to this condition.

Difficulties occasionally arise in doubtful cases, in which, after a single visit, and perhaps a very slight examination, the medical attendant simply drops a card to the Health Department, notifying it of Scarlet Fever. The placard is affixed next day, and the parents regarding the quarantine restrictions somewhat irksome, or for other reasons, call in another physician, perhaps after the rash has disappeared, who pronounces it his opinion that there is no evidence of the disease, and furnishes a statement to that effect to the parent of the child, who, in turn, appears at the Health Office demanding the removal of the placard. In all such cases it has been the rule of the Department to insist, before any card is removed within the prescribed limit, that the medical man reporting such case shall notify the Department in writing that subsequent observations failed to confirm his former opinion. It will be quite clear to any one who has had experience in such matters that any other course would give rise to discords between members of the profession, and also place the department in a position of legal uncertainty.

Physicians are sometimes in the habit of notifying the Department by telephone, but as up to the present time there is no satisfactory means of recording telephonic communications, such communications cannot be officially accepted as legal notification of disease. The Act definitely and distinctly provides the form of notification, and physicians are required to comply therewith in order that the notification can be placed on file, and used for subsequent reference.

As to the length of time required for the isolation of contagious disease, it varies very much according to the nature of the case, more especially in such cases as Scarlet Fever and Smallpox.

I have seen cases of Scarlet Fever in which the symptoms were so slight as to be scarcely observable, followed by little or no

desquamation, and I am confident that the quarantine restrictions could with perfect safety have been removed at the end of 21 days. I have seen other cases where the premonitory and eruptive symptoms were equally slight, but were followed by severe and continued desquamation, and the communication of infection, even at the end of 12 weeks. One of the greatest difficulties which a practical sanitarian has to face is the uncertain nature of the materies morbi of this infection, and the avenues of its dissemination. The question is certainly most obscure, and while I believe that the infection is principally disseminated by exfoliated epidermic scales, I am also of the opinion that the evaporation of urine from a patient affected with Scarlet Fever, may communicate the disease, and as the involvement of the kidney occurs at a later date than that of the skin, this may serve to explain a certain number of cases of remarkably late infection. As we know the lesion of the kidney introduced by Scarlet Fever is in the main a desquamative nephritis, it must be admitted that the epithelial scale may in each case be a potent factor. Within practical lines, so far as Scarlet Fever is concerned, I think it may be reasonably assumed that where the cases show no desquamation at the end of the third week, not even branny desquamation, the case is tolerably safe, although not absolutely so.

In the case of Diphtheria we have fortunately a means whereby the specific germ is isolated, tested and examined, so that the Bacteriologist can with almost absolute certainty state the presence or absence of infection. The large number of cases discharged from the Isolation Hospital of the City of Toronto as cured, and the absence of return cases from such families, bear eloquent testimony to the value of such bacteriological examination as is conducted in connection with the Department in the management and control of this disease. Many physicians do not fully recognize the intimate association and close continuity of the throat, Eustachian tube, and ear, as well as the extent of the recesses of the nasal passages. This oversight leads occasionally to the fact being overlooked that the ear discharge may occur in Diphtheria as it does in Scarlet Fever, and that such discharge can only appear externally after it has led to rupture of the tympanic membrane, and is quite as infectious as a discharge furnished from any other infected part. The ear discharge may appear late in the disease, and be fraught with the most disastrous results. Bacteriological research has frequently emphasized

the fact that many cases of slight nasal diphtheria are at first entirely overlooked and are not discovered until the source of infection in a severe epidemic has been thoroughly studied and investigated, when their initial importance becomes evident.

The City of Toronto during the last year has been invaded five times by Smallpox, these attacks furnishing seven cases. In approaching the question of the quarantine of Smallpox I am more than ever convinced that the two secrets of success in handling the disease in a densely populated community are first; the capability of accurately diagnosing the disease; secondly, the prompt, complete and absolute isolation of those infected and exposed to infection.

Towards saving a community exposed to Smallpox infection more can be done during the first five hours after the case has appeared than is possible in many weeks, at a later stage, when the associations and communications of the infected patient have either escaped or been forgotten. The removal of the patient to the Smallpox Hospital, the absolute and complete quarantine of the family or families exposed, and vaccination of the inmates of the house, or residents of the neighborhood, if circumstances warrant it, are the three imperative and essential steps in curtailing the spread of the disease.

During December, 1898, a case of Variola appeared in the city. It was a mild case, and therefore the more dangerous to the public. There was a fair number of pustules on the face, hands, and exposed parts of the body. A local physician was consulted who regarded the case as an obscure skin affection. In consequence of this the patient was permitted to mingle unrestricted with the general public, and did actually attend the theatre with the pustules of Variola on hands and face, the Health Department receiving no notification of there being any suspicion of Smallpox in the community until after the appearance of a second case in the household. In the second case, which appeared in the person of a child aged 14, a physician was called in on the third day of the eruptive stage, and promptly diagnosed the case as one of Chickenpox. He continued to attend until the eighth day of the disease, when a consultation was held, but both physicians were of the opinion that it was a case of Chickenpox. The neighbors, however, became alarmed, and notified the Health Department, whereupon an examination by officers

of the Department revealed a case of typical Variola, with well marked cellulitis of the face, and a general diffused pustular eruption. The patient was immediately removed to the Smallpox Hospital, and the house placed under quarantine.

On August 30th, 1899, the department was notified by a medical man of the existence of a suspected case of Smallpox occurring in the western portion of the city. Upon investigation it proved to be a moderately severe case of Variola, confluent on the face, and discrete over the limbs and trunk. This case had undoubtedly been contracted from a mild case across the street, which had been treated from start to finish as a case of Chickenpox, and which case would likely have led to a severe general infection of the entire city had it not been for the comparatively secluded locality of the house where the case occurred. These two instances sufficiently emphasize the value and importance, so far as protection is concerned, of the prompt diagnosis of Smallpox, and while I have no desire to enter upon the clinical character of the disease, yet I cannot refrain from emphasizing the fact that the so called pustular Chickenpox is usually Smallpox, that Varicella is vesicular from the start, that Variola is preceded by a distinct stage of papule, and that Cellulitis, when associated with a pustular eruption, is invariably due to Variola. The failure on the part of so many to diagnose Smallpox, is the outcome of sanitation itself, for with the introduction of vaccination, and sanitary measures for the suppression of the disease, the number of physicians familiar with it is every year becoming smaller. Smallpox is easy of diagnosis, but a practical rather than a theoretical knowledge of the disease is essential. Individual susceptibility plays a most important part in the spread of the disease; which also follows the rule of other infectious diseases, --that the amount of infection generated is proportionate to the extent of surface involved, and the extent of the rash in a large measure determines the quantity of pathogenetic matter.

The stage of the disease has of course a great influence upon its infectiousness. I have never seen any evidence to warrant the belief that Smallpox is infectious during the period of incubation, but it certainly is infectious during the papular stage, as in one of the cases above referred to the patient was removed from the house before the appearance of vesicles, and yet another member of the household took the disease, as far as could be determined, by simply entering the room prior to the patient's removal.

In the five invasions of Smallpox which have occurred in the City of Toronto, eight cases occurred in five houses, and in only one instance did it spread to an adjacent house, the back yard of which communicated with that where the first case had appeared.

When quarantine is discussed from the standpoint of a Health Officer it must be admitted that there are degrees of infectiousness in the so considered contagious diseases. Ring-worm and Scarlet Fever, show in this particular a marked difference in degree, and other infectious diseases vary greatly in results and importance. Few regard measles as a disease of much gravity, while none approach the mildest varioloid with other than feelings of the greatest concern, and justly so. For this reason the quarantine of Smallpox demands greater, persistent, and more stringent vigilance than any other of the ordinary contagious diseases.

Quarantine is maintained day and night by a re-lay of officers, three men being generally sufficient to secure effectually the quarantine of one house. Should, however, the inmates of such premises prove unruly, I would not hesitate to increase the number to an extent sufficient to enforce the quarantine requirements. It is infinitely more economical to deliver a decisive blow at the start, than by a passive observance of partial quarantine, permit the progress of the disease until it excites public alarm, and a corresponding re-awakening to vigilance.

It has been the rule in Toronto to provision those who are under quarantine for this disease, and for the Local Board of Health to furnish such supplies, yet there might be circumstances in a severe and extensive epidemic where such could not be done. I think, however, it is a reasonable position to take that the inmates of houses, who, for the sake of the public safety are confined to their own domiciles, and forbidden to mingle with the general public, and prevented from engaging in any employment, should be fed at the public cost.

VACCINATION.

The question of vaccination necessarily arises in connection with the management and control of Smallpox epidemics, and presents itself to the Health Officer in very different form from that in which it is viewed by the ordinary practitioner, inasmuch as the

former is compelled to devise practical means of securing the vaccination of a large community, and which means will materially vary according as to whether or not there is much opposition entertained to the practice. I am pleased to be able to state, that as far as the City of Toronto is concerned, the opposition against the practice of vaccination is a mere nonentity. It is the rule that among the educated and well informed the opposition to vaccination is infinitely less than among the ignorant and superstitious.

With the volume of testimony compiled by reliable medical men, in all quarters of the globe, I can scarcely see how any room can be left for the discussion of the efficacy of the practice. The operation of vaccination as practiced to-day upon a large scale is very different from what it was fifteen years ago. At that time the family physician was more in evidence than he is to-day; the development of specialism in medicine has had its influence, even upon this trifling operation. The family physician formerly attended to all the ailments of the family, and one of his regular duties was the vaccination of the children. He vaccinated with lymph, or crust, obtained from the arms of patients he knew well, whose family histories were as clear to him as a well-written book. Arm to arm vaccination was the practice, and in such practice the typical vaccinations such as described in the text books occurred—the redness and hyperæmia on the 3rd day, vesicles on the 5th—the pearl on the rose leaf—followed by a crust reaching maturity on or about the 8th day. With bovine virus, no matter from what source, all this is changed, and although I have performed many thousands of vaccinations, in my capacity as Health Officer, during the last seven years, I can truthfully say I have never yet seen from bovine virus a typical vaccination as above described. The bovine virus is slower than humanized lymph, it usually begins to take on the 8th day, often later, it develops more or less acute inflammation, a wider extent of hyperæmia, more or less lymphangitis, possibly œdema of the arm, in rare cases extending to the fore-arm, and if the arm be knocked or bruised, or injured by the adherence of the clothing or bandages, a dark greyish, black blood crust forms, which separates by a process of sloughing, leaving behind a more or less cleanly defined ulcer, which generally heals by granulation from the bottom. The scar which ensues is mostly cicatricial, showing at the edge a foveated dimpled appearance.

In some cases the manifestations of inoculation are very much fainter than I have described, but in the common run of cases they pursue a course similar to that briefly outlined.

Recently I have had experience with upwards of 7,000 vaccinations performed in the brief space of one month, using lymph from different sources, and neither in this experience, nor in any during the past, have I found anything that could be construed into harmful or bad results, which fact I think here worth recording, more especially as some have attempted to poison the public mind by harrowing pictures of the permanent evil effects attendant upon the practice.

The following table embraces 2,259 vaccinations which have been carefully re-inspected at a period varying from three to four weeks after vaccination, and the statistics are prepared with the objects of showing the number successful; those not healed at the end of a month; and those in which the vaccination was attended with more or less severe results, such as deep sloughing and inflammation of the fore-arm. It will be noticed that the unsuccessful attempts at vaccination only amounted to 3.6 per cent.

	Cases inspected.	Successful.	Unsuccessful.	Severe.	Unhealed after 28 days.
Dr. Creasor.....	621	608	13	187	47
Dr. Fenton..	604	583	21	1	..
Dr. McCallum	500	472	28	64	39
Dr. Smith.....	534	514	20	31	..
	2,259	2,177	82	283	

In my vaccinations I have used ivory points exclusively, as I have found the capillary tubes too slow for practical use by one who has a dozen or two vaccinations to do daily. It is a matter of some importance that the operation be conducted with as little harshness or display of force as possible, so that there may be on this score no foundation for opposition to the practice.

In order to test the quality of the virus used I requested Professor Shuttleworth to examine bacteriologically three of the prominent kinds of vaccine in the Canadian Market. He reports on them as follows:

No. 1. Vaccine points, contained in a corked bottle, enclosed in a wooden case.

No. 2. Vaccine points enclosed in a metallic case.

No. 3. Fluid vaccine, enclosed in a corked tube, enclosed in a wooden case.

"All the samples were in unopened original packages, and each of them contained material for ten vaccinations.

"Four bouillon cultures of each were made of Nos. 1 & 2. This was accomplished by clipping off with sterilized scissors the lance shaped ends of the ivory points, and allowing two of these to drop into each tube of bouillon. Four-fifths of sample No. 3 was allowed to drop from the broken capillary end of the containing tube into the culture fluid.

"All the samples were incubated at 98°. After 24 hours No. 1 & 2 were very cloudy, and showed abundant evidence of growth. No. 3 became cloudy by mere mixture of the lymph with the bouillon, but after 24 hours in the incubator, this mixture was tested in fresh tubes of bouillon and in no case gave any evidence of growth. No. 3 may therefore be accepted as being sterile, or at least not containing an organism capable of development in the medium employed.

"The cultures of No. 1 were plated in gelatine, and at 68 showed numerous colonies of two organisms—a liquefier and a non-liquefier. The former proved to be a bacillus, which by microscopical and cultural characteristics could not be identified with any described organism which has the power of readily liquefying gelatine. The non-liquefying bacillus answered to microscopical, cultural, and chemical tests for *Bacillus coli communis*.

"Bouillon cultures of No. 2 were plated and found to contain a liquefying, non-motile micrococcus, sometimes solitary, but more frequently appearing as diplococci, somewhat flattened, and measur-

ing 1.0 to 1.0 microns for the pair. Liquefaction of gelatine took place rather slowly. I have not been able to identify this coccus as being pathogenic, as for this purpose animal experiments would be necessary, and also for a more complete test of the liquefying organism in No. 1."

I have on previous occasions drawn attention to the necessity for public vaccination by posters and other announcements, and have used the fire-halls as stations at which the public might be vaccinated free of charge. In my experience this method has been found of little or no use, and more recently I have adopted with better success the schools as the avenues by which the public may be reached, and free vaccination in infected districts is now carried on by such means. The first score or so will be watched by the other pupils, and their parents, and after the simple nature of the operation is understood, the unvaccinated pupils will readily submit, and parents of children not attending school will also avail themselves of the facilities thus offered.

To reach the adults I have had better opportunities by communicating with the employers of labor, and attending in workshops, and factories, securing from the directorate of such places a detailed statement of those vaccinated, and also of those, who, on inspection, showed satisfactory evidence of protection by a previous operation.

In factories and shops where clothing is handled and made, this plan has been largely put into execution, and with excellent results. The inconvenience and loss of time occasioned in the factory amounts to very little when the system of inspection is thoroughly, carefully, and practically organized. It takes but a short time to have the employees paraded in single file, presenting their vaccination marks to the Medical Inspector, while a couple or three clerks write down the names as fast as they are called, marking them as protected, or otherwise, according to the evidence presented.

I hope in the future to have on the books of the Health Department of the City of Toronto, a complete and perfect record as to this particular, with regard to every employee. When we consider how rapidly and insidiously an epidemic of smallpox may gain headway in cities, despite the efficiency of the Health Department, and how the spread of Smallpox above and beyond all other diseases is

attended by the overwhelming disaster to trade and commerce, and serious financial loss, apart altogether from the question of suffering and loss of life, I think it will be agreed that the work of efficient protection should be carried on at a time when alarm does not exist, and when the duty can be deliberately undertaken.

I cannot leave the subject without expressing some measure of disapproval of the employment of the so called vaccination shield. I am free to admit that dirty clothing, and dirty fingers, will produce sepsis in the abrasion produced for vaccination, the same as in any other wound, but I am also confident that the pressure exercised upon the superficial capillary vessels by the shield tends to produce œdema in the neighborhood of the inoculation, particularly so if the shield is secured to the arm by strapping or tape, and leads to more sloughing and a greater production of serum. I have found a much better precaution in the liberal application of pure olive oil, or zinc ointment, which when applied immediately the spot begins to be sore will be sufficient to prevent the introduction of dirt, and will also protect the prominent papillæ so frequently seen on the arms of those in whom the skin is naturally rough or inclined to chafe.

FOOD INSPECTION.

One of the most important questions relating to food inspection which confronts the Health Officer is the thorough inspection and supervision of milk, cattle, and the shops, houses, and utensils where milk is kept, or offered for sale.

The dairies of the City of Toronto have during the past year received considerable attention at the hands of the Health Department. No one is permitted to take out a license for the sale of milk who does not present to the license authorities a permit from the Health Department stating that the premises in which the milk is kept is in a good sanitary condition. The books in which such inspections are recorded are arranged to cover six visits per annum, and one officer has control of this particular work. His duties are to regularly visit such premises, and report upon their general condition as to cleanliness, the condition of the cans, measures, and utensils used in the handling of milk, the arrangements for storing the milk, the situation and character of such store room, the management of the cooling vats, nature of the ice used, and character of

drainage. Upon these lines the premises are classified as *satisfactory*, *fair or not satisfactory*. Those in the latter class are not furnished with a permit for the sale of milk. In this particular connection we have found considerable difficulty, more particularly in the proper cleansing of cans and milk utensils. It is surprising that in comparatively large and well-equipped dairies, where the proprietor goes to considerable expense in providing cooling vats, concrete cellars, and store rooms for the reception and keeping of the milk, he permits the cans in which he receives the same to be rusty and dirty. Under the lid, collar, and in the seams of the cans one can find old deposits of curd, or fatty matter, which not only tend to the souring of milk, but prove a suitable medium for the development of germs, more or less noxious in character.

Cans that are worn ought not to be used, as it is almost impossible to cleanse a rusty can. The Milk Inspector is also responsible for keeping a perfect and complete detailed list showing where the milk sold by the retailer is produced, how many cans daily are shipped to him from the producer, the name and address of such producer, so that in the event of any contagious disease manifesting itself along the line of the milkman's route we can determine with comparative definiteness whether such disease is traceable to the producer or retailer.

Assuming that the Health Department has knowledge of typhoid appearing in unduly large proportion among the customers of a certain dairy, it at once becomes the duty of the Department to inspect the premises where such milk is produced, with a view to ascertaining whether any disease exists in the family of the dairyman, also the character of the drainage, water supply—for cattle and washing purposes—as well as the relation of the privy pit to the well. As in many cases several farmers are concerned in the supply, especially if a large quantity of milk is handled in the retail dairy, this investigation becomes a matter of considerable importance, and occupies considerable attention and time.

The total milk supply for the City of Toronto embraces 1,634 cans daily, furnished from an area of country of upwards of 30 square miles.

In addition to these inspections, the Department also looks after the quality of the milk itself. Samples are taken at regular intervals

from the waggons of retailers' labelled, by number, and transferred to the analyst, who tests the milk solely as to quality, having regard to the amount of butter-fat, total solids, etc. Reports of these analyses are furnished to those from whom the milk samples are taken. The result of this work has been to show the retailer exactly the kind of milk he is delivering, and through him to re-act upon the producer.

I do not think that wilful adulteration of milk is practised to any extent in the City of Toronto. These periodical bulletins, for they amount to that, of the quality of a milkman's milk, are known to the public, and become in a certain sense testimonials to the milk man, and in this way have a decided effect in the prevention of adulteration. The amount of butter-fat which is accepted by the Health Department as indicating fairly good milk is 3 per cent. This I admit, is a comparatively low average, but we endeavor to demand simply what can reasonably be claimed a fair average. If the butter-fat falls below 3 per cent., notice is sent to the vendor, calling his particular attention to this fact, and if, on subsequent samples being taken, the milk shows a continued low average a summons is issued against the milkman.

I do not desire to ignore the influence of food and breeding on the quality of milk, and during last year I had a thorough and careful inspection made of the cattle-byres lying outside of the municipality, with a view to determining the general character and condition of the cattle, food, premises, etc. The results of such inspection were eminently satisfactory, and things were found to be in a much better state than what the Department had anticipated.

The Health Department also undertook to enforce regulations for the compulsory testing of all dairy cattle with tuberculin, as to the existence of tuberculosis, and after the cattle had been tested and reported upon in the manner described, by a veterinary surgeon approved of by the Department, it was proposed to keep such schedules of inspection on file in the Health Department. Unfortunately, however, after the work had been arranged for, and initiated by the Department, the Provincial Government withdrew from the Act the power enabling us to enforce the regulation, in consequence of which, it stands at present in abeyance.

This Department has had abundant evidence to prove that contagious disease can be rapidly and extensively communicated by

milk. In connection with the reports of contagious disease, and the inspections incidental thereto, a careful report is kept of the milk supplied, the milkman's name being recorded therein, and every dairy is debited with each case of diphtheria, scarlet fever or typhoid which occurs among the customers. This record has proved invaluable in tracing the origin of infectious diseases, and last year particularly so, as it was by this means that a sharp outbreak of typhoid in the northern portion of the city was located and arrested.

In this dairy the daily distribution of milk amounted to thirteen cans—104 gallons—about five cans being bottled on the premises. There were thirty-three cases of typhoid fever traced to this milk route. The premises were in a bad sanitary condition, and it was found impossible to get the proprietor to conform to the orders of the Department. In the imperfect condition of the law there was considerable difficulty in managing the case, but, by the concerted action of the Board of Health, the dairy was closed, and the business conducted in other premises, with the result that typhoid entirely disappeared from the milk route.

The public are not fully alive to the absorbent character of milk. The carelessness with which it is placed in ice boxes, and pantries, when in the hands of the consumer, and the complaints that are frequently made regarding peculiar tastes and changes in milk which has been so kept, show that much education has yet to be done on these lines.

Bottled milk still continues to be popular, and what I have stated in regard to the cleaning of milk cans applies with equal force to bottles, with the difference that as the bottle enters the house of the consumer it is exposed to contaminations to which the can is never liable. Most of the bottles are improperly cleaned, and occasionally not cleaned at all, but are taken from one house, and, after being refilled from the can in the milk cart, are delivered to another customer. That this is a fact can be seen daily upon any streets where bottled milk is delivered.

MEAT INSPECTION.

Meat may undergo putrefactive changes, after being prepared for the market, which render it unwholesome and unfit to be used as food. It may also be affected by disease from which the animal was previously suffering.

Healthy beef has a marbled appearance, is reddish in color, firm in consistence, and exudes a reddish juice on standing. The fat is firm and whitish-yellow in color. In putrefaction it becomes less firm in consistence, and emits an odor proportionate to the stage to which putrefaction had advanced. If decomposition has progressed far the flesh becomes somewhat dark and greenish, emits a dark, offensive blood or serum, is friable, and when handled or cut emits a foul odor. Putrefaction in meat is said to be due to certain micro-organisms, which transform the constituents of the meat into other bodies, largely gases of evil odor, besides ptomaines, some of which are more or less toxic in character. The commonest result of eating meat in an advanced stage of decay is diarrhœa, due to irritation caused in the alimentary canal by the bodies produced in the putrefactive process, yet it is undoubtedly true that certain other bodies are contained in the meat which, if admitted into the general circulation, would act as direct poisons, if the meat were uncooked or underdone. These bodies do occasionally enter the system and produce febrile disorders, malaise, etc. The temperature at which meat is cooked is about 65° C., and this is sufficient to destroy a large proportion of the putrefactive products, as well as to completely arrest the process of putrefaction.

Disease may be transmitted through the meat of affected animals containing worms or ova of various species of entozoa, or it may result from changes in the meat from pyrexia and feverishness in the animal, which, in turn, render it injurious to man.

Pork is affected with *Cysticercus Cellulose*, causing the Tape Worm (*Tænia Solium*). The *Cysticercus* of beef gives rise to *Tænia mediocanellata* in man. Meat of animals dead in transit contains the blood of the animal, and as this is not only in the large vessels, but also permeates the small vessels of the tissues, it renders the muscle soft, and the meat more liable to early putrefactive changes. For this reason it is considered unwholesome.

Measley beef is that which is affected by *Cysticercus Tænia-mediocanellata*. It shows here and there, scattered through the muscles, small cysts containing more or less fluid. These cysts can generally be ruptured upon firm pressure being made with the thumb nail; they occur in the cellular tissue between the muscular fibres generally, and hence are best seen in lean meat. This condition is

not prevalent to any extent in America, but is occasionally met with. I have seen one case in Toronto, and several in abbatoirs of the United States; these cysts contain, in addition to the watery ingredients of the cyst, the head of the common tape worm. Cooking readily destroys it, and it is in the form of beef sausage that it is most liable to gain entrance into the alimentary canal of man.

Cysticercus Cellulose affects the hog, and when present in his muscles constitutes what is known as measly pork. It is of more common occurrence than measly beef, and produces appearances very similar, so far as the flesh of the animal is concerned. The cysts are generally larger and the serum contained therein clearer. The under part of the tongue, the meat along the belly, and muscles of the side will generally show them most distinctly. The carcass often shows numerous petechial extravasations under the skin, possibly due to a degree of feverishness developed in the animal, which do not appear to occur in the bovine. The skin is also clammy and sweaty, remaining so for weeks, and the fat and flesh do not set well. I have met with five cases of measly pork in seven years, so that it cannot be said at all of frequent occurrence in our Canadian hog.

In Prussia, according to Lenckart, it occurs in one carcass out of every 370. The flesh of both measly beef and pork should, of course, be destroyed.

Trichina Spiralis is a parasite of the pig, although it attacks other animals, which gives rise to the disease known as trichinosis. I have never seen a case of it in Canada. The parasite is a coiled or spiral worm located in a cyst in the midst of the muscle itself, and most prone to affect the tongue, neck and spleen, diaphragm and intercostal muscles. The meat has a speckled appearance, and the parasite is easy to escape detection.

Actinomyces.—The ray fungus, the name given to this disease by the botanist Harz, is an infective disease occurring among cattle and more rarely affecting man. It is probably the commonest of all diseases to be met with in cattle offered for beef purposes in our meat market. It generally affects the head, either the upper or lower maxilla, or both, and is up to a certain time limited to the location of occurrence, when it is said to be localized or encysted. After a time, however, the suppurative mass breaks down, and either through the blood vessels or lymphatics of the animal, or both, the infection

becomes general. When localized it presents the appearance of a bony tumor, with much inflammation of the adjacent tissues of the gum, often with adherence to the cheek. If at all advanced, the tumor appears soft in patches, crackles under firm pressure, and, when opened, trabeculæ of bone are seen running through it, while the cavernous spaces of the growth exude a clear or yellowish serum, which, upon microscopic examination, will be found to contain the fungus or actinomyces of the disease. When the infection is general, the lungs, liver, spleen, and other viscera will often show invasion of the disease. These growths are generally considerably larger than in the bone, and more easily broken down, though the cystic character of the disease continues throughout, and show a more or less alveolar framework of fibrous tissue. The disease spreads by infection among cattle, the actinomyces being introduced through an abrasion of the gum, or in some cases through a decayed tooth.

During the year there passed through the cattle market 142,013 cattle, not including calves. These were examined by our Inspector, with the result that 66 animals were discovered to be affected with actinomycosis, to a greater or less extent.

The disposal of these animals was affected in conformity with the practice established in most countries. They were all slaughtered under competent veterinary supervision, and, when the disease was strictly local, and confined exclusively to the head, this part of the body was removed and destroyed, and the balance of the carcass passed as fit for food. In cases of general infection the entire carcass was destroyed.

PLUMBING AND DRAINAGE.

The sanitary condition of the plumbing and drainage of houses is an important question constantly forcing itself upon the attention of the Health Officer.

A building with an imperfect plumbing and drainage system is no longer an asset, but rather a burden to its owner, and the consideration of the subject is one of such importance that I venture in this report to outline what may be considered the essential requirements of a satisfactory solution of the question. The smallest house should have a water-closet and sink, and, as the building increases in

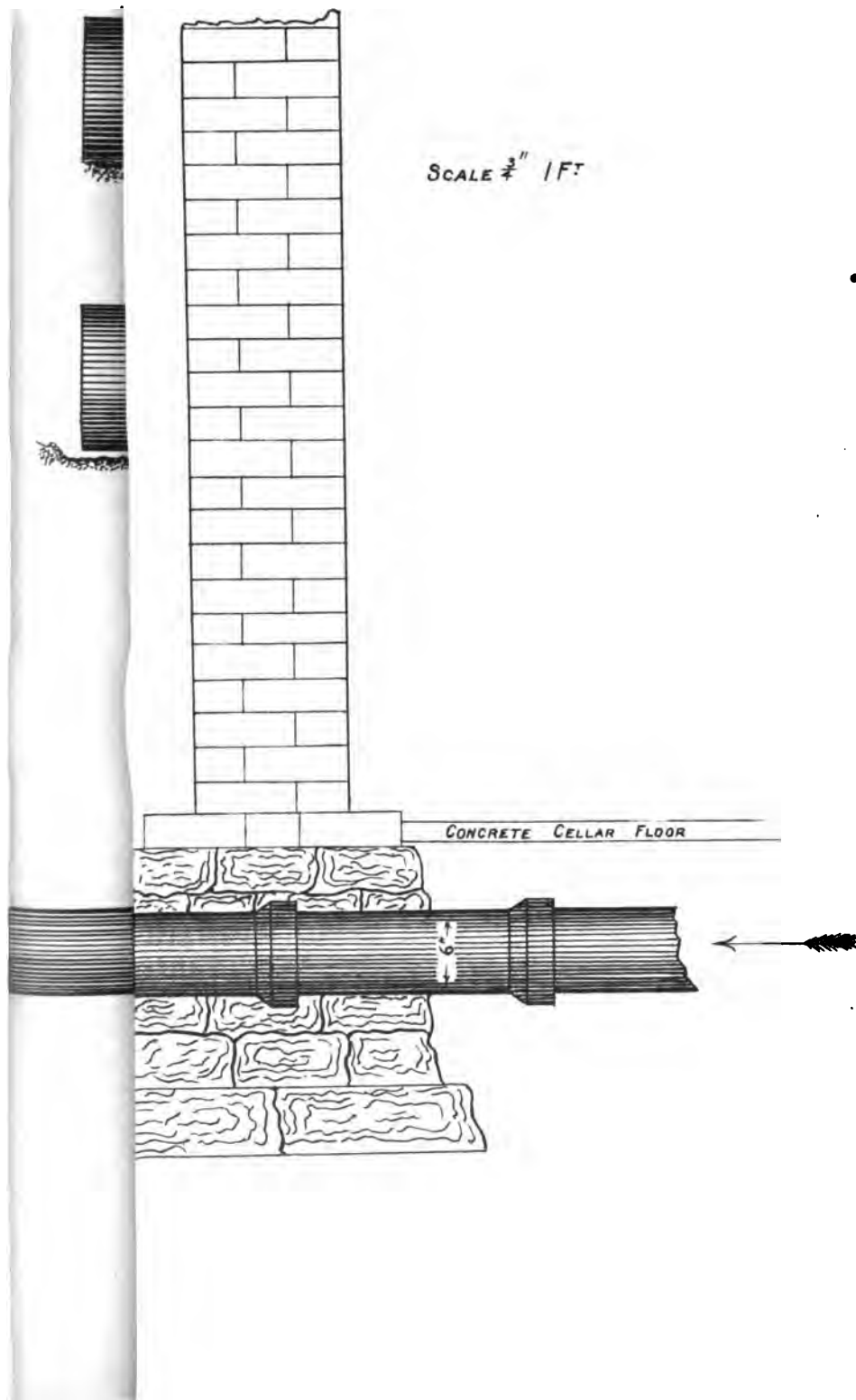
size, the conveniences should also increase, provided they are justified by the demand. Such accommodation may include bath, wash-basins, laundry tubs, pantry and slop sinks and urinals, all of which should be supplied with a plentiful supply of hot or cold water as required. Each fixture should be placed in such a position that it can be readily cleaned, and should not be located in a room which is not in communication with direct light and air. Consideration should also be given to the question of convenience to adjoining rooms. Laundry tubs, for instance, should be placed where access to drying space is easy, and kitchen sinks where light and room are plentiful. Plumbing fixtures should not be placed in a sleeping room; neither should any building have in it a fixture that is not likely to be used, as there is danger of its traps becoming dry from evaporation, with consequent escape of sewer gas.

Having first had the private drain from the sewer to the street line constructed, it is then possible to know at what depth a house drain is to commence, and also at what depth it is to be finished, so that the fall or grade for each length of pipe can be accurately determined. It is then necessary to ascertain what carrying capacity certain sized pipes will have with the grade we have at our disposal. A drain larger than is absolutely required is not an advantage, inasmuch as drain pipes are the better for being thoroughly flushed.

The trench to receive the drain should be commenced at the street line, and carried directly, or as nearly straight as possible, to the various fixtures and rain-water leaders. The trench should be roughly graded at first, but, before pipes are laid, it should be accurately cleaned off, care being taken that no more earth is removed than required to give the proper grade. It should next be determined where the hubs of the pipes will rest, and enough earth should be excavated from under such points as to allow the straight portions of the pipes to rest firmly upon the earth. In cases of newly-made earth or running sand a plank should be used, or a bed of concrete.

The trench should be made at least eighteen inches wider than the size of the pipe, so as to permit of a man walking up the excavation without stepping upon the pipe. Where tiles are used they should be of vitrified clay, thoroughly glazed inside and out; smooth internally and as cylindrical as possible.

All branches, or changes in direction, should be made by full Y's and necessary curves; no right-angle junctions should be used.



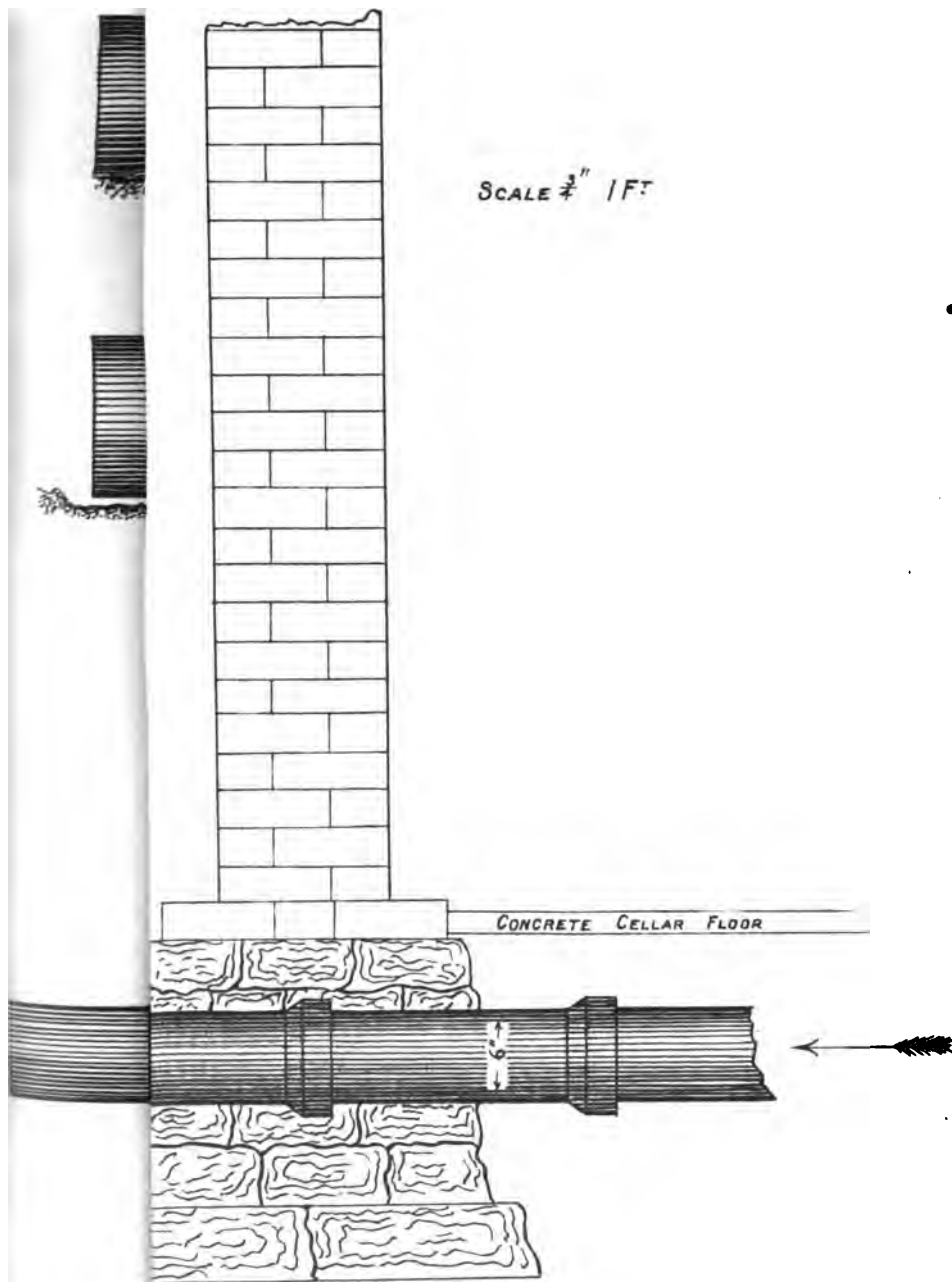
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and all bends should be as open, and at as great an angle as circumstances will permit. All traps should be perfectly sound, and have a sufficient seal.

It might be advisable to have a trap of at least three inches between the bottom of the pipe and the top of the water seal, thus giving solids passing down the drain sufficient momentum to carry them past the bridge of the trap. All main traps should have at least a $1\frac{1}{2}$ inch seal.

In laying the trap a proper hole, or trap-pit, should be excavated, so that the bottom of the trap may rest securely. Usually the main trap is placed at the street line, and is the first portion of the drain laid on private property. Where the drains are of tile an air inlet is next placed in position, which branch is a T pipe placed on its back. From thence the drain is run in any required direction to suit the termination of the plumber's work, and the sub-soil water branches in the cellar, and the rain-water leaders outside of the building. The connection for sub-soil drainage is usually made by using a hand-hole running trap for one of the storm-water leaders, and connecting the sub-soil drainage with the hand-hole of the trap. In cases where this trap is situated inside of the building the hand-hole is extended up to the top of the cement floor, and a grating placed over it, which supplies the extra convenience of "a cellar floor wash," the floor being graded to such point.

All storm-water leaders must be trapped. The trap must be on a branch from the main drain; but no trap must intervene between the main trap and the plumbing fixtures. This does not mean that each rain-water leader must have a separate trap; but permits of a number of leaders being so connected as to run through one trap.

In laying the pipes care must be taken that the joints are pressed home. Portland or other cement is used, without sand, the joint being filled from the outside and thoroughly trowelled. It might be mentioned that it would be better were the hubs or pipes splayed, so that when the pipe is pushed home there will be no difference in the level at the bottom of the pipe, otherwise, unless a great deal of care is taken, a shoulder, large or small, according to the size of the hub, will be left. After the joint is made a scraper should be used to remove any cement that may have fallen inside of the pipe.

Where drains pass under or through walls an arch should be turned over them sufficient to protect them from sinking from settling of the wall. Many instances might be given in which the settling of walls has caused serious damage to the drainage system.

After the drain is laid, and terminated at the proper point, it should be made ready for testing. The water test is one which is generally used. All the openings being made level, by placing bends and pipes where necessary, the main drain is plugged at the air inlet with rubber, clay, linseed meal or other suitable stopper. The whole system is then filled with water, care being taken to get all the air out of it. If the drain be tight the water will maintain a constant and uniform level. Should it not do this, it is evident that a leak exists, which leak will require to be located and made good, and the test again applied. On the drain being proved to be tight, it is next to be determined if it be clear. The usual method of testing is to pass a ball (generally glass) about $2\frac{1}{2}$ inches in diameter down the drain. By walking along the trench it can be followed, and the location of any stoppage determined. If the ball stops rolling there must be some obstruction, which should be removed. Should the drain have to be broken in order to remove the obstruction, a second test will be required.

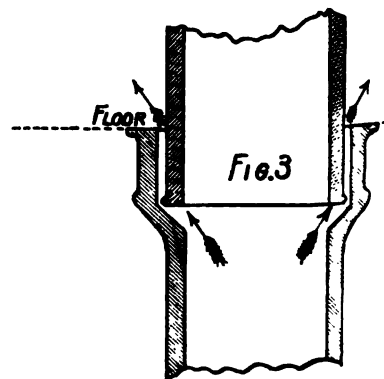
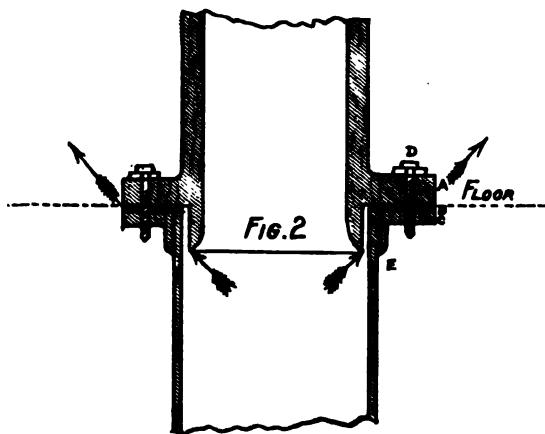
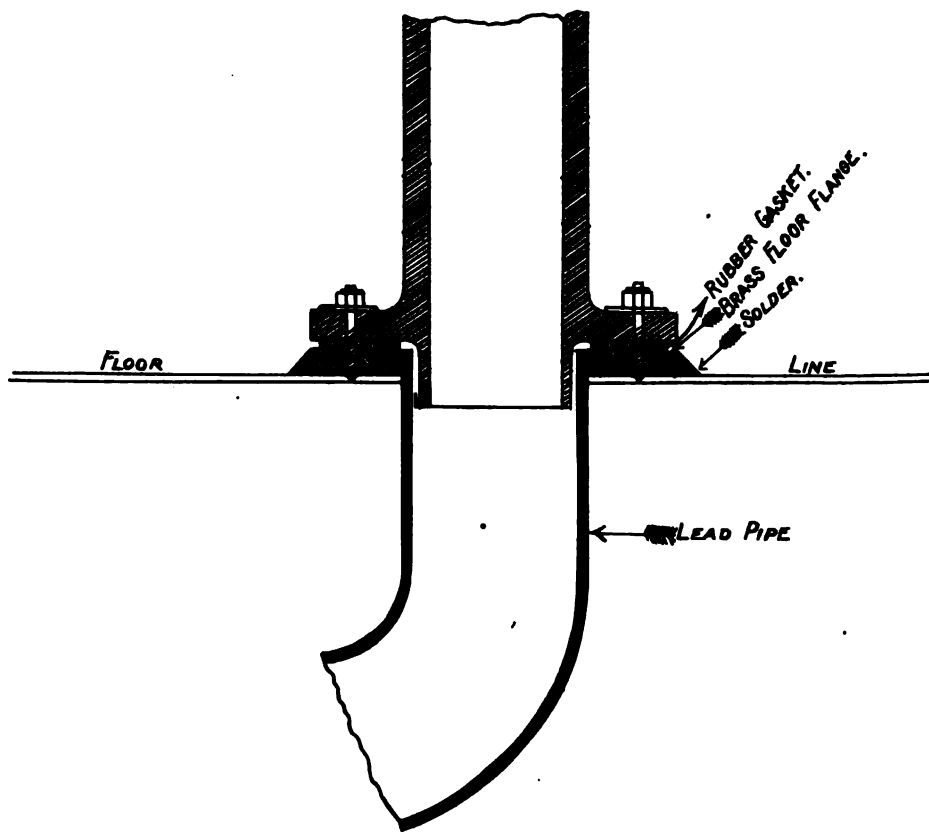
The principal reason for the general use of tile drains appears to be their cheapness and the ease of laying. It must, however, be remembered that a tile drain is often constructed by inexperienced men, and it is easily injured, while in cast-iron pipes the joints occur at every five feet; there is no cement to drop into the pipe; the bore is smooth; the pipe straight, and the joints, being made with lead, make the drain less rigid. An ordinary laborer will not undertake to make a hole in an iron pipe to secure connection. Cleaning screws or fittings can be placed in the drain, so that if it should be choked it can be easily cleaned without excavation. The drain can, if desired, be attached by hangers to the wall of the cellar, where it can be readily inspected at all times. Cleaning screws should be placed at such points in iron drains that rods can be passed through the drains with as little trouble as possible.

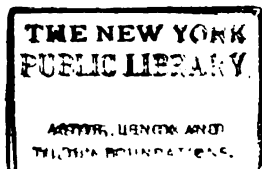
PLUMBING.

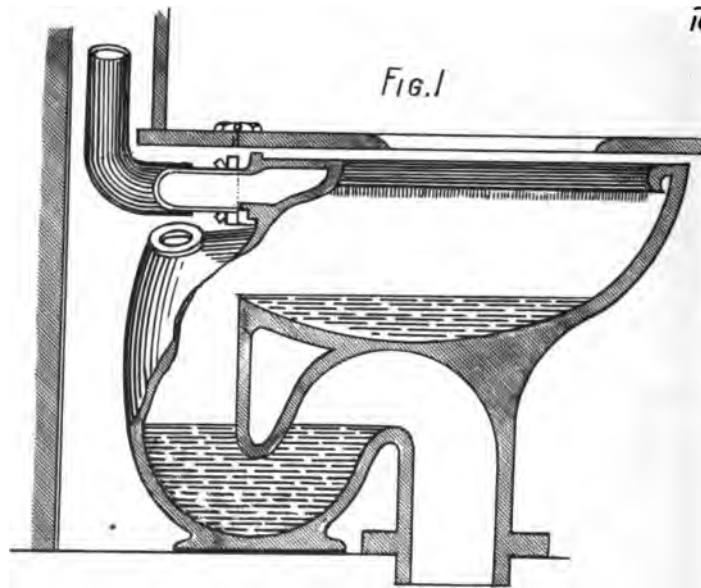
The drains having been put in a satisfactory and sanitary condition, and properly tested and filled in, the next thing to be done is to locate the plumbing fixtures. In this no more pipe is to be used

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than is absolutely necessary, so that it may be thoroughly flushed. The soil pipe is placed in position, running as straight as possible up to and three feet above the roof, and away from all openings of the house or building, leaving fittings to receive wastes from various fixtures, care being taken that no right-angle junction is used on other than vertical pipes. Should it be necessary to insert into a horizontal pipe and waste, a full Y, with the requisite bend, should be used.

Nearly all fixtures are connected to wastes by means of lead. Sometimes traps made of brass, iron or porcelain are used. Each plumbing fixture should have its own separate trap, which should be placed as near to the fixture as possible. Care should be taken in selecting a trap that it is smooth inside, of the proper shape, and with a sufficient seal. The shape should be such as will offer the most resistance to siphonage, and, at the same time, not retard the flow through it. The size of the trap should be governed by the amount of water which is to pass through it. From the crown of every trap a vent pipe should be taken, one size smaller than the size of the waste pipe. The object of this pipe is two-fold: first, to act as a break siphon; secondly, as a vent pipe. The by-law permits this pipe to be of wrought iron, with steam fittings, which, owing to the fact of its being cheaper, is in many cases used instead of cast iron, brass, or lead, but is not so good, owing to its liability to rust, or scale, and which even galvanizing will not entirely prevent. This pipe should commence and continue to rise after it has once left the trap, and it should be so constructed that it cannot act as an overflow for the fixture to which it is attached, in the event of the waste becoming choked. These pipes are usually carried up and connected to the soil pipe above the highest fixture, but in some cases they are carried through the roof independently. Pipes which pass through the roof should not be less than four inches in diameter at the roof line.

There should be a cleaning screw placed in this pipe near the trap, and the pipe should be occasionally examined to see that it is clear. Waste pipes should be straight, and as short as possible, care being taken, where bends or offsets are made, that the bore is not decreased, and that the back of the bend is not reduced in thickness.

All fixtures should be of non-absorbing material, made of a pattern that is easily cleaned, and always left open, so that, in airing a room containing a closet, all parts of the fixtures will be ventilated.

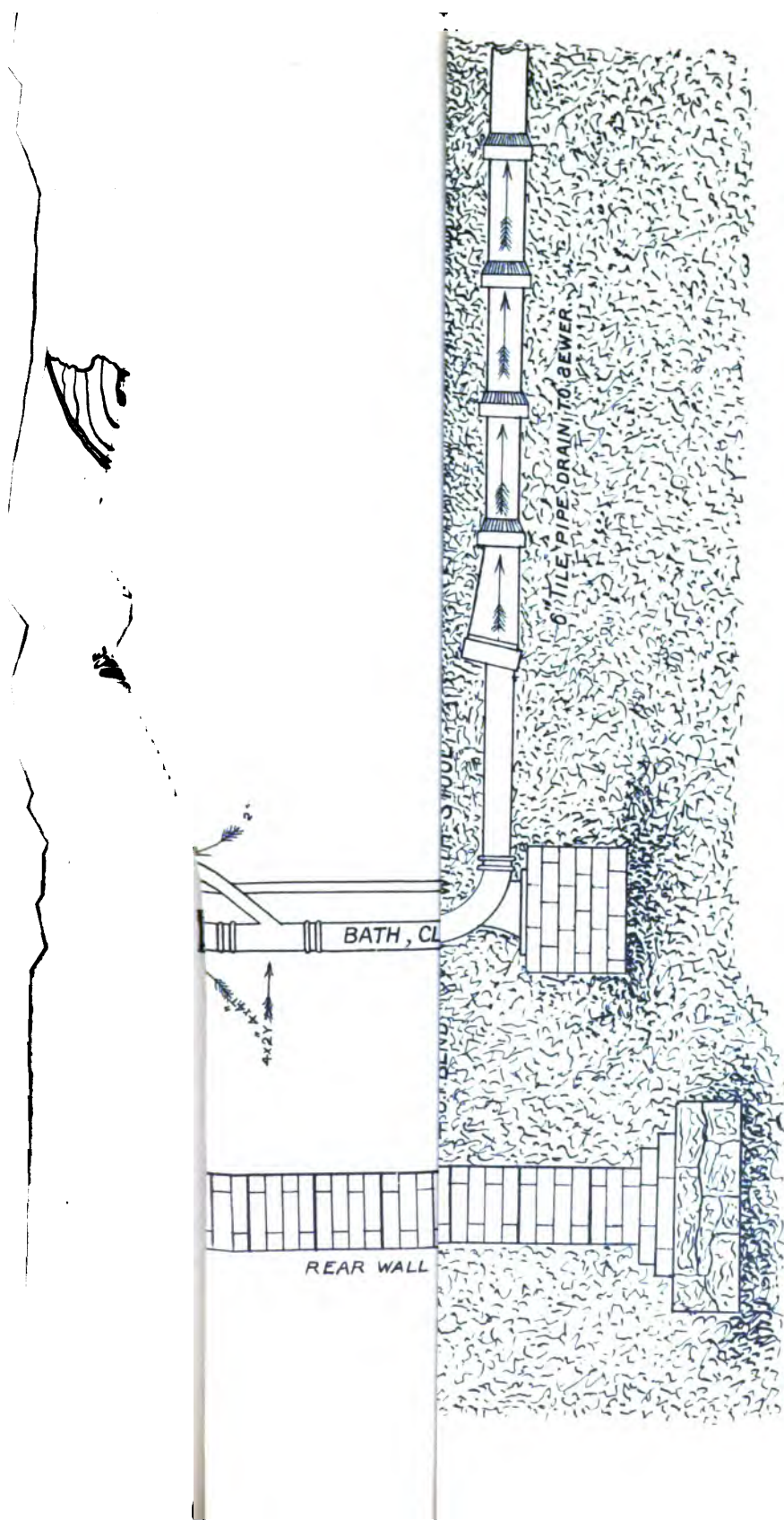
In the case of water-closets, they should be so constructed that all parts will be thoroughly washed each time the tank is discharged; operate as noiselessly as possible; have proper water seal, and retain sufficient water to prevent solid matter adhering to the closet. Each water-closet, slop sink or urinal should have a three-inch, or larger, local vent, properly connected to fixture and terminated in a heated flue.

After the plumbing and drainage systems are connected the smoke test should be applied to see that all connections are tight which have been made since the water test was applied to the rough work of the system.

STATEMENT OF CASES OF CONTAGIOUS DISEASES REPORTED DURING THE PAST
TEN YEARS.

Typhoid Fever.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1890	27	26	48	29	52	29	19	154	221	125	96	81	907
1891	64	27	24	33	45	25	24	184	133	156	88	52	855
1892	27	16	9	11	25	19	25	57	88	69	49	31	426
1893	35	111	239	43	15	13	6	20	27	27	25	15	476
1894	11	12	7	51	11	6	6	34	38	29	34	10	249
1895	8	15	7	5	5	6	17	37	62	141	47	18	368
1896	12	2	6	10	5	6	25	75	105	56	24	10	334
1897	7	13	11	9	12	5	11	19	33	44	15	20	199
1898	13	10	4	11	6	3	3	20	23	28	17	13	151
1899	9	3	5	19	15	3	3	33	50	57	17	11	225



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ASTOR, LENOX AND
TILDEN FOUNDATION

Scarlet Fever.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1890	17	25	25	19	20	35	12	13	24	35	43	22	300
1891	31	24	26	19	17	23	22	22	19	38	96	70	407
1892	49	99	74	63	55	47	29	21	38	53	75	68	671
1893	100	70	50	52	77	48	56	29	20	33	35	24	554
1894	28	33	47	34	55	18	25	24	25	29	20	24	371
1895	17	18	14	5	6	7	8	9	6	6	5	12	113
1896	3	8	7	2	3	4	5	3	18	44	44	71	212
1897	104	172	265	205	212	180	59	26	26	30	57	48	1,384
1898	51	42	41	32	32	40	46	48	70	121	147	140	310
1899	141	126	130	89	71	52	47	46	58	76	105	75	1,013

Diphtheria.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1890	18	20	21	24	18	25	33	35	41	61	64	73	433
1891	53	45	25	18	47	73	52	36	76	176	246	192	1,039
1892	141	182	150	163	141	122	75	41	75	195	174	146	1,625
1893	115	79	100	57	84	57	20	30	21	40	30	41	583
1894	40	28	21	23	25	15	12	11	13	32	37	81	338
1895	81	52	39	33	46	41	34	16	24	38	49	53	506
1896	73	47	47	30	45	37	28	23	25	50	64	93	562
1897	63	80	85	78	78	52	45	50	35	38	65	70	719
1898	65	47	25	23	33	22	23	27	34	40	50	37	426
1899	37	27	31	39	54	46	38	39	27	33	70	60	501

The following shows the number of cases and deaths reported to the Health Department for the official years ending October 31st, 1898 and 1899:

1898.		
	Cases reported.	No. of deaths.
Scarlet Fever	628	17
Diphtheria	474	60
Typhoid Fever	156	36
1899.		
Scarlet Fever	1,123	55
Diphtheria ..	458	82
Typhoid Fever	227	34

DEPARTMENT OF FOOD INSPECTOR.

Charles Sheard Esq., M.D., Medical Health Officer, Toronto:

Dear Sir,—I beg to submit my report for the year ending October 31, 1899, and would suggest for your consideration what steps can be taken to ensure the destruction of all animals found dead on the cars, or in the cattle market. Our present system is not wholly satisfactory. The City could erect a small plant in connection with the Crematory, where any amount of heat now going to waste could be utilized; and, from the men now employed, select one for this work. We would then be perfectly sure of the destruction of all dead animals, and any value in them over and above expenses could be returned to the shipper.

I have the honor to be, dear sir,

Your obedient servant,

ROBERT AWDE.

MEAT AND FOOD INSPECTION.

From November 1st, 1898, to October 31st, 1899, the following animals passed through our Cattle Market for export and home consumption:

Cattle	142,013
Hogs ..	247,985

Sheep	104,972
Calves.....	5,457
Total ..	500,427
Decrease	21,870

Of the above, 118 were found to be affected with actinomycosis or other diseases. These animals were all slaughtered under competent veterinary inspection, carefully examined and dealt with, each on its merits. In cases of osteo-sarcoma the disease was in every case confined to the part affected. In other cases of glandular tumors, more than one was frequently found in surrounding tissues of the tongue and throat. In six cases the tumors were found to be clearly tubercular, extending to the lungs, and in one case with numerous lesions in the viscera of the abdominal cavity.

In the above six cases, and in two others, the carcasses were destroyed, and 110 were passed as fit for human food, except the heads and tongues, which were destroyed.

Eleven cattle, 183 hogs, 48 sheep, and 17 calves died on the cars, or in the market, from injuries received during transit. These were duly consigned to the tank to be rendered down for fertilizing purposes, and thus kept out of the food supply of our City.

REPORT ON DISEASED CATTLE.

Total number of cattle stopped	118
Actinomycosis cases, killed and passed	64
Tuberculosis cases, killed and passed	4
Throat tumors, undefined, killed and passed	28
Broken jaw, killed and passed.....	1
Abscesses	3 100
Balance	18
Shipped out by permission	5
Taken out without permission	2
Cases slightly affected	3 10
Balance	8
Confiscated tubercular cases	6
Confiscated actinomycotic cases	2 8

SHOP INSPECTIONS.

Butchers' shops, other than in Markets	2,374
Shops where poultry and fish are sold	1,172
Shops where bread and fish are sold	6,364
<i>i</i> Total number of inspections	9,910

Five weeks during the year was spent inspecting Farm Dairies and Cow Byres.

MARKET INSPECTIONS.

St. Lawrence Market is visited daily, and in the season the Fruit Market and Young Street Wharf; other markets are taken with the streets on which they are located.

CONFISCATIONS.

The following is the list of confiscations made during the year indicated:

1,806 lbs. of beef, mutton and veal.
550 lbs. of hearts and kidneys.
16,753 lbs. of fish.
10 gallons of oysters.
56 cases of Finnan haddie, and a large quantity of loose ones.
25 boxes of smelts.
3 baskets of ciscoes.
118 turkeys.
6 geese.
22 ducks.
77 chickens.
9 brace of partridge.
27 baskets of peaches.
3 baskets of egg fruit.
166 crates of melons.
3 crates of cucumbers.
6 baskets of red currants.
16 baskets of tomatoes.
3 bbls. sweet potatoes, and also a quantity of bananas found on pedlar's waggons, and other places.

Bread.		Butter.
201 loaves....	Hospital for Sick Children	59 rolls.
234 loaves....	House of Industry.....	9 rolls.
96 loaves....	House of Providence.....	17 rolls.
10 loaves....	Boys' Home	30 rolls.
101 loaves....	Girls' Home	15 rolls.
206 loaves....	Children's Shelter	44 rolls.
57½ loaves....	Working Boys' Home	59 rolls.
270½ loaves....	Protestant Orphans' Home....	4 rolls.
41 loaves....	Sunnyside Home ..	4 rolls.
1,217 loaves, total.		Total..237 rolls.

ROBERT AWDE,
Inspector.

SANITARY DEPARTMENT.

Classification of complaints received at office:

Full and foul privy pits	1,275
New privy pits established without permit	8
Foul dry earth closets	93
Foul and wet cellars	261
Foul wells and cisterns	17
Foul sewers ...	25
Foul stables ...	66
Filthy yards and premises	342
Filthy rag shops	2
Water under houses	47
Water on vacant lots	31
Defective plumbing and drainage	667
Garbage and manure on vacant lots	199
Miscellaneous	180

SUMMARY IN DETAIL OF WORK DONE IN SANITARY BRANCH.

Total number of complaints	3,213
Total number of inspections of nuisances	7,881
Total number of notices served respecting complaints.	2,507
Total number of house to house inspections.....	6,234
Total number of inspections of livery stables	55
Total number of inspections of slaughter houses	42

Total number of inspections of city milk depots	2,397
Total number of inspections of country milk depots..	94
Total number of inspections of cow byres	419
Total number of milk samples collected (retail)	421
Total number of milk samples collected (wholesale)..	177

PROSECUTIONS DURING THE YEAR ENDING OCTOBER 31ST, 1899.

For full and foul privy pits	29
For emptying contents of privy pit in lane	1
For establishing new privy pit	2
For defective plumbing and drainage	19
For foul cellars	4
For filthy yards	4
For filthy premises	12
For foul water on vacant lots	1
For keeping cows within prescribed limits	6
For selling milk without a permit	1
For neglecting to report contagious diseases	3
For breach of Plumbing By-law	22
For breach of Ice Regulations	1
For breach of Quarantine Regulations	1
For breach of Act for the Protection of Infant Children....	5
Number of summonses issued	77
Number of cases in Court November 1st, 1899	2
	—79
Number of cases withdrawn (work done)	43
Number of cases fined	20
Number of cases dismissed	5
Number of cases remanded for sentence	6
Number of cases still in Court (October 31st, 1899)	5
	—79

NATURE OF OFFENCE.	NO. OF FINES.	AMOUNT OF FINES.
Breach of Plumbing By-law	13..	\$35 00 and costs.
“ Act for protection of infant children	4..	19 00 “
Neglect to report contagious disease	1..	1 00 “
Keeping cows within prescribed limits	1..	1 00 “
Emptying contents of privy pit in lane	1..	2 00 “
Total amount of fines		\$58 00 “

PLUMBING AND DRAINAGE DEPARTMENT, 1899.

Month.	Applications for Inspection.		Inspection Made.				Notices Mailed.		Permits Issued for								
	1897.	1898.	1899.	Plumbing.	Drainage.	Smoke Tests.	Total.	Letters.	Printed.	Plumbing & Draining.		Plumbing Only.		Draining Only.		Totals.	
										Permits.	Buildings.	Permits.	Buildings.	Permits.	Buildings.	Permits.	Buildings.
November, 1898.	314	354	626	418	261	87	762	384	318	43	58	48	53	61	68	152	179
December, 1898.	241	330	565	385	247	94	726	379	151	16	23	29	31	26	32	71	86
January, 1899.	230	284	381	268	130	85	483	324	138	17	27	24	27	26	37	67	91
February, "	268	275	355	302	136	55	493	279	122	18	29	34	43	6	8	58	80
March, "	332	304	586	504	243	68	815	349	246	34	38	49	53	34	53	117	144
April, "	273	393	591	468	281	67	816	355	405	60	80	60	80	50	60	178	220
May, "	299	475	800	647	407	76	1130	404	436	58	74	72	80	63	81	193	235
June, "	317	449	716	529	376	62	967	394	321	53	69	57	71	40	67	150	207
July, "	365	403	812	615	377	103	1095	451	307	51	66	55	81	39	44	145	191
August, "	314	502	770	634	407	99	1140	354	312	66	85	49	56	27	32	142	173
September, "	350	545	655	549	267	62	878	343	375	62	101	58	65	53	82	173	248
October, "	368	613	709	569	364	81	1014	387	377	57	79	61	71	53	69	171	219
Totals.	3671	4927	7566	5888	3496	939	10,323	4403	3508	535	729	604	711	478	633	1617	2073

NOTE.—This year's work shows an increase of 53 per cent. in "Applications for Inspection"
 55 per cent. in "Inspections Made"
 35 per cent. in "Number of Permits Issued."

} more than last year.

AMBULANCE REPORT.

Charles Sheard Esq., M.D., Medical Health Officer, Toronto:

Sir,—I beg leave to submit the following statement of the total number of calls received from November 1st, 1898, to October 31st, 1899; 900 in all, which were disposed of as follows:

Removed to General Hospital—

Typhoid Fever ..	82
Measles	13
Chickenpox	2
Milk Leg	1
Tonsillitis	2
Kidney disease	1
Tubercular Meningitis	3
Blood Poisoning	10
Gangrene	2
Erysipelas ..	19
	—135

Removed to Isolation Hospital—

Measles	1
Scarlet Fever ..	367
Diphtheria ..	262
Suspect Smallpox ..	5
Chickenpox	1
Smallpox	6
	—642

Removed to St. Michael's Hospital—

Typhoid Fever	46
Blood Poison ..	2
	— 48

Removed to Western Hospital—

Typhoid Fever	9
---------------------	---

Removed to Grace Hospital—

Typhoid Fever	34
---------------------	----

Removed to Victoria Hospital—

Typhoid Fever	13
Blood Poisoning	1
Removed to other houses	3
Ambulance not required	15
	—

900

Ambulance Fees, \$30.

MORGUE REPORT.

Total number of bodies placed in the Morgue:

1898 November	1	1899 May	4
December	1	June.....	0
1899 January	2	July	6
February	3	August.....	2
March	1	September.....	3
April	4	October	1
	12		16
		Total.....	28
Male	23	Adults	23
Female	5	Children	5
	28		28

Your obedient servant,

F. HAGUE.

REPORT OF THE MEDICAL SUPERINTENDENT OF THE
ISOLATION HOSPITAL.

*Charles Sheard, Esq., M.D., M.R.C.S., Eng.,
Medical Health Officer, Toronto:*

Sir,—I have the honor to submit, herewith, in a concise form, a report of the cases of contagious diseases admitted to the Isolation Hospital for treatment during the year ending November 22nd, 1899.

Total number of patients.—The total number of patients of all kinds admitted to the Hospital, during the year, was 804. Of these 458 were admitted for scarlet fever, 334 for diphtheria, 8 for small-pox, 1 for chickenpox, and 3 for measles. The number of deaths during the year was 58, but 6 of the patients who died were moribund when they were brought to the Hospital, and expired immediately. The death rate, including the moribunds, was 6.16 per cent., and, excluding them, it was 5.48 per cent.

Scarlet Fever.—The number of scarlet fever patients admitted during the year was 458. These consisted of 360 cases of scarlatina simplex, 75 of scarlatina anginosa, and 23 of scarlatina maligna. The complications were not numerous, and with a few exceptions were not serious. They consisted of adenitis, otorrhoea, albuminuria, rheumatism, anasarca, and convulsions. There were 18 deaths, 7 being cases of scarlatina anginosa, and 11 of scarlatina maligna. Three were moribund when admitted. The death rate was 3.93 per cent, or a fraction less, if the moribunds are excluded.

Diphtheria.—There were 334 patients admitted for diphtheria during the year; but, when a bacteriological examination of the patients was made, it was found that 42 of them did not have the disease, so that the exact number of diphtheria patients which had to be dealt with, at the hospital for the year, was not 334, but 292. Of the 292 cases of true diphtheria admitted, 183 were tonsillar or pharyngeal; 6 naso-pharyngeal; 38 laryngeal, and 10 laryngo-naso-pharyngeal. Forty of the number died, 2 pharyngeal, 23 naso-pharyngeal, 11 laryngeal, and 4 laryngo-naso-pharyngeal. Three of the patients who died—laryngeal cases—were moribund when brought in, one died within an hour, one within five hours, and the other within ten hours after admission. The death rate, including moribunds, was 13.69 per cent.; excluding moribunds it was 12.80 per cent.

One hundred and thirteen of the patients had, in addition to the ordinary hospital treatment, antitoxin administered to them. The antitoxin used, was that of the Parke, Davis Co., Detroit, and that of the Mulford Co., Philadelphia. It was given in quantities varying from 500 to 5,000 units, according to age and severity of attack. The patients treated were a fair sample of the patients treated at the Isolation Hospital from day to day, year out and year in. They were neither better nor worse than other patients. Of the 113 cases so treated, 64 were pharyngeal, 19 naso-pharyngeal, 23 laryngeal, and 7 laryngo-naso-pharyngeal. Twenty-one of the patients died; 2 pharyngeal, 8 naso-pharyngeal, 8 laryngeal, and 3 laryngo-naso-pharyngeal. The death rate was 18.58 per cent. No doubt the late period, rarely earlier than the 2nd or 3rd day of the disease, at which patients are brought to the Hospital, keeps the mortality rate of all such institutions, under every method of treatment, somewhat higher than it would otherwise be.

Smallpox.—There were two outbreaks of smallpox during the year—one in December, 1898, and one in July, 1899. The disease did not spread beyond the houses in which the outbreaks occurred. The precautions taken by the Medical Health Officer effectually prevented the further spread of the disease, on each occasion. There were 8 cases in all, 3 in December and 5 in July. Five of the cases were of the discrete form, and 3 of the more or less confluent form. All the patients recovered. They were housed as usual in the wooden building and not in the Isolation Hospital proper.

Chickenpox and Measles.—One case of chickenpox and 3 of measles were admitted to the Hospital during the year. They were mild cases and speedily recovered.

Respectively submitted,

G. TWEEDIE, M.D.

November 30th, 1899.

REPORTS MADE TO THE MEDICAL HEALTH OFFICER
ON
WORK DONE IN THE BACTERIOLOGICAL LABORATORY,
AND ON
INFECTIOUS DISEASES,
BY
E. B. SHUTTLEWORTH, Phar.D., F.C.S.

REPORT ON CITY WATER SUPPLY.

October 31st, 1899.

Charles Sheard Esq., M.D., Medical Health Officer, Toronto.

Sir,—Bacteriological estimations of the quality of the water supply have been continued throughout the official year, and have afforded the following numbers, which refer to colonies per cubic centimetre. The samples were all taken from the tap in the old Laboratory in the St. Lawrence Hall.

1898.		1899.	
Nov. 3.....	180	May 29.....	152
" 11.....	955	June 6.....	219
" 18.....	260	" 12.....	201
Dec. 2.....	640	" 19.....	168
" 10.....	760	" 27.....	393
" 24.....	4,905	July 3.....	189
1899.		" 10.....	237
Jan. 4.....	420	" 17.....	231
" 14.....	4,200	" 24.....	451
Feb. 4.....	2,625	" 31.....	135
" 16.....	275	Aug. 8.....	363
" 28.....	4,430	" 15.....	299
Mar. 6.....	23,892	" 21.....	301
" 14.....	16,258	" 31.....	312
" 22.....	18,304	Sept. 6.....	258
" 30.....	6,952	" 12.....	167
Apr. 8.....	13,002	" 19.....	567
" 19.....	3,410	" 26.....	246
May 1.....	1,992	Oct. 4.....	314
" 5.....	1,936	" 12.....	135
" 15.....	225	" 19.....	141
" 22.....	274	" 24.....	127

If the foregoing figures be reduced to monthly averages, and put in parallel columns with similar returns for the past five years, an opportunity is afforded for making a comparison, as in the following table:—

Monthly Averages.

	1898-9.	1897-8.	1896-7.	1895-6.	1894-5.	1893-4.
November.....	465	1,239	2,021	977	1,840	420
December.....	2,152	5,298	4,415	1,788	5,255	2,050
January.....	2,310	2,876	1,281	1,717	2,086	5,235
February.....	2,443	6,968	1,432	3,851	785	7,196
March.....	16,351	10,860	8,716	5,058	5,852	5,172
April.....	8,206	2,357	2,947	8,469	8,983	2,359
May.....	915	489	1,178	651	422	1,172
June.....	245	248	327	251	495	270
July.....	248	350	350	329	542	236
August.....	319	385	335	360	326	206
September.....	309	247	313	292	1,758	310
October.....	179	287	344	406	1,360	342
Monthly average.	2,845	2,631	1,980	2,012	2,470	2,080

In order to facilitate conclusions the figures for five years, from 1893 to 1898, may be better condensed as monthly averages for that period, and thus compared with last year's results.

	Average, 1898-9.	Average, 1893-8.
November.....	465	1,299
December.....	2,152	3,761
January.....	2,310	2,629
February.....	2,443	4,046
March.....	16,351	7,131
April.....	8,206	5,022
May.....	915	772
June.....	245	318
July.....	248	361
August.....	319	322
September.....	309	584
October.....	179	548
Monthly average.....	2,845	2,234

From a consideration of the final averages—2,845 and 2,234—it is evident that the quality of the water supply, as indicated by a numerical count of bacteria, was inferior to the average of the

five preceding years. The cause of this must be sought for in the months of March, April and May, for with these exceptions the figures for all the other months of last year are less than those for the preceding quinquennial period.

The records for the first week of March last, when the numbers of bacteria equalled 23,892 per cubic centimetre, show daily rain, becoming very heavy on the 5th, the total precipitation equalling 2.24 inches. As a result the Humber and Don Rivers were in flood, the water in the latter completely filling the artificial banks at Queen Street. The effect was intensified by strong south-westerly gales which to some extent checked the distribution of the river water in the lake, and disturbed the deposits near shore. During the second week there were heavy rains and strong winds, mostly west and south-west, but less violent than before. The number of micro-organisms dropped to 16,258, but on the occurrence of heavy easterly gales, and heavy snow, during the third week, the number increased to 18,304. The weather then became colder, and the Bay and Don again froze over, to be in turn broken up by floods from rain and melted snow. This state of things continued until the middle of April, when all but the last traces of snow had disappeared.

The figures for May last are larger than those for the average of the quinquennial period, but not so much so as to call for further remark. It is in March and April that the principal increase is noticeable, and, as may be inferred, is due to the fact that the advent of spring, last year, was attended by very stormy and rainy weather, and was more protracted than is usually the case.

It must however be borne in mind that the amount of organic matter in the lake water during times when it is affected by local causes, as the flooding of its subordinate tributaries, must naturally become greater with the extension of the area of land under cultivation, or the increase of population, or industries on the sections drained by such streams. As far as Toronto is concerned the solid matter carried down by the Don and Humber rivers, or the city sewers, is usually deposited in the bays into which these streams discharge, and it is only at certain seasons, at times of flood, when the volume and velocity of these feeders is great, or when there is disturbance by storms, and that of their resultant counter-currents, that

contamination of the lake water, at the Intake, is liable to occur. Such conditions exist, and, in the ordinary course of events, their influence will become greater, hence it cannot be expected that the quality of the water supply will improve.

I continue the usual comparison of quarterly averages in which the results are arranged on a seasonal basis.

Averages by Seasons.

	1898-9	1897-8	1896-7	1895-6	1894-5	1893-4
Oct., Nov., Dec....	968	2,293	2,280	1,402	2,477	996
Jan., Feb., Mar. ..	7,084	6,908	8,809	3,542	2,897	5,867
Apr., May., June...	3,122	1,014	1,484	3,123	3,300	1,256
July, Aug., Sep.....	292	327	332	327	633	250

Lake Level.

The average level during the past year was lower than in 1898, though the difference only amounted to one inch. The averages for the past decade, 1890-9 inclusive, as taken from the Harbor Master's records are herewith reproduced, and will prove useful for comparison:

1890.....	23.14 inches above zero.
1891.....	11.85 " " "
1892.....	1.71 " " "
1893.....	8.67 " " "
1894.....	6.14 " " "
1895.....	12.25 " below "
1896.....	8.75 " " "
1897.....	5.00 " " "
1898.....	3.00 " above "
1899.....	2.00 " " "

The average heights for the different months of 1899 were as follows:—

January ...	1.66 inches below.	July.....	11.00 inches above.
February ..	2.50 " "	August	6.00 " "
March	0.50 " above.	September..	0.66 " below.
April	7.50 " "	October	4.00 " "
May	11.50 " "	November..	6.50 " "
June	12.66 " "	December...	8.00 " "

The water reached its highest point on June 4th, when the gauge registered 15 inches above zero. The lowest record was 12 below zero, on December 6th, showing an extreme range of 27 inches during the year.

Temperature of the Tap Water.

The temperature of the water supply varied between 69° and 34°. The former degree was reached on September 2nd, last, and is the highest shown by any available records. On July 28th, 1897, the temperature was 68°, which was the maximum to that date, while in 1898 the highest point, 63°, was reached on the very unusual date of October 5th.

Sudden high temperatures generally occasion alarm, as the conclusion is formed that they are occasioned by the inflow of warm bay water into the conduit. Such results would naturally follow, and thermal changes require close watching. So far, however, there has not been any ground for doubting the integrity of the conduit. On September 2nd the temperatures registered along the pipe line were practically uniform. They were as follows:—Shore crib, 70° Basin, 69°. Hanlan's crib, 70°. Engine house well, 68°. City Hall tap, 69°. Laboratory tap, 69°. As a matter of fact the water in the Lake was a degree warmer than when it reached the city tap.

Extremes of water temperature are of course primarily traceable to that of the air, but are generally directly resultant on the direction and force of the wind. Southerly and easterly winds blow the warm surface water shorewards, where it accumulates, forcibly displacing the colder stratum below. Winds from the opposite quarters drive off the warm superficial water down the Lake or across to the southern side. This fact has always been remarked by persons bathing at the Island, and to a certain, though less sensible extent, is applicable to the water at the Intake, which, though over 50 feet from the surface is sharply affected by winds of long duration or considerable force. On one occasion, after a continued easterly blow, I noticed only half a degree of difference between the water at the surface and at a depth of seventy-three feet. Ordinarily, in summer, there would be a difference of twenty to thirty degrees between these points.

I append, in the usual comparative form, the averages of temperature of the City Hall tap water, as calculated from the records

of the Engineer's Department, and which correspond with those of the Laboratory tap, but are preferable as being taken at more frequent intervals.

	1894-5	1895-6	1896-7	1897-8	1898-9
November.....	44.4	42.6	42.8	45.7	48.5
December.....	39.9	38.1	38.8	40.5	39.3
January.....	36.1	36.1	36.8	38.0	37.0
February.....	36.5	33.8	33.8	35.2	36.0
March.....	36.5	33.8	36.5	36.8	35.0
April.....	37.4	37.9	39.0	40.3	38.0
May.....	42.9	44.0	43.8	44.1	42.7
June.....	44.0	48.2	44.4	46.8	44.9
July.....	48.8	47.8	54.6	54.7	48.8
August.....	48.2	48.0	53.9	52.8	55.7
September.....		51.6	54.3	53.7	53.3
October.....		47.3	51.3	56.1	52.0

The average temperature for the year 1899 was 44.5.

The Reservoir.

The reservoir was emptied and cleaned out between Nov. 12th and 18th, but nothing was done in regard to the contemplated cementing of the remaining third of the bottom. It is to be hoped that this may be accomplished during the coming year.

I have the honor to be, Sir,
Your obedient servant,

E. B. SHUTTLEWORTH.

REPORT ON ICE SUPPLY.

PICKERING HARBOR.

Toronto, Ont., November 8th, 1899.

Charles Sheard, Esq., M.D., Medical Health Officer, Toronto.

Sir,—On November 3rd I visited Pickering Harbor for the purpose of determining its suitability as a source of ice supply during the ensuing winter.

The Harbor is situate in Frenchman's Bay, about twenty miles east of Toronto, and three miles west of Pickering Station. Dunbarton, a small village and station on the G. T. R. line, is located about one and a quarter miles north of the mouth of the Harbor, and Liverpool, another and smaller village, lies half a mile east of Dunbarton, and on the same concession line.

The bay, or inlet, forming the Harbor, is about a quarter of a mile across, and a mile deep. It has mainly resulted from the denuding action of three creeks which here enter the Lake. These are now almost dry, but were formerly very considerable streams, bringing down detritus and sand. The organic matter has been largely deposited where the streams enter the bay, thus giving rise to a marsh, while the outgoing current, meeting the wave-action of the Lake, has given rise to a sandbar, which stretches across the mouth of the inlet. Through this has been dredged a cribbed channel, a hundred feet wide, which runs nearly north and south, and is carried out into the Lake, the western pier being provided with a light-house. The conditions somewhat resemble those existing at Toronto, the marsh and sandbar being probably formed in the same way.

About one and a quarter miles back, and north of the light-house, and at the extremity of the inlet, is the G. T. R. track, and a short distance north of this are the two villages referred to.

It is said that the creeks are altogether dry in summer, and frozen in winter, but, at the time of my visit, there was a little water passing down each. The eastern creek, formerly known as Saw-mill Cut, was nearly dry, and in any case only extends less than a mile north. The middle stream, known as Tannery Creek, passes through the village of Dunbarton, and thence about two miles north; while the western creek, once styled Brennan's Cut, takes its origin about two and one-half miles in a north-westerly direction. All the creeks, when running, are fed by springs, and on none of them, except Tannery Creek, are there any houses in close proximity.

The objectionable point on the latter stream is at the old Tripp store, at Dunbarton, where, within about thirty feet of the creek, is a privy, the contents of which are liable to wash down the steep declivity into the water beneath.

The north end of the inlet is a peaty bog through which meanders Tannery Creek. At the point at which it enters the open water

the depth is four to six feet, but from this part the depth decreases to two to four feet, until nearly west of Bay St., where on the east side there is an expansion of the channel with a depth of five to six feet. Further south is a dredged channel which extends from the wharf to the piers, a distance of about eleven hundred feet, the water ranging from nine to twelve feet in depth. In the angle to the east of the wharf the average depth is about two feet. In all places other than the dredged portions there was evidence of there having been in summer a plentiful growth of weeds. Such parts might be described as marshy, while as before stated, the north part is solid bog, which, for a considerable distance is continued up both sides. The shores, and indeed the country around here, is composed of a stiff clay.

The topography of the Harbor will be better understood from a copy of the Government plan which I herewith submit, and also from a sketch which approximately shows the surrounding neighborhood.

From a consideration of existing conditions it was evident that if ice is to be taken from this locality it would have to be cut from, or near to, the dredged portion, where the water is kept in a fresh condition by the ebb and flow through the channel. I accordingly selected three stations as follows: No. 1. Middle of channel between piers. Depth, 12 feet. Sample taken at 9 feet. No. 2. Dredged channel, half-way between wharf and pier. Depth, 11 feet. Sample taken at 7 feet. No. 3. Midway between Bay St. and sandbar, on a line running south-west. Depth 6 feet. Sample taken at 4 feet.

The weather conditions at the time the samples were taken, and those immediately preceding this period, were exceedingly unfavorable. A very heavy south-easterly sea was running and forcing the muddy water through the channel, and causing considerable disturbance in the Harbor. Besides this there had been much rain, which also tended to make the water very turbid.

A biological examination of the samples of water taken afforded the following results:—

No. 1. Between piers	1,243	cols.	per cc.
No. 2. Between wharf and piers.....	488	"	"
No. 3. South-west line	1,139	"	"

The fresh lake water thus appears in the worst light, doubtless in consequence of the disturbance by wind, while No. 2 sample is, considering the circumstances, of fairly satisfactory quality. In all the samples there were from eight to nine different species of bacteria represented.

Despite these high numbers, which are easily accounted for, as stated, I am of opinion that this place may be utilized for cutting ice for domestic purposes. The limits I would suggest are defined on the Harbor plan, and embrace the dredged channel, and the deep extension at the easterly part. A line drawn from the south-east corner of the wharf to the east pier would represent the southerly limit, while that on the north is defined by a line drawn southwest from the fence which marks the so-called Bay St.

In case a permit is given for cutting ice in this Harbor it should only be on condition that the outhouse at Tripp's store should be removed, and that no other places of this kind, or of any other character objectionable to the Toronto Board of Health, should be erected at a nearer distance to any of the streams than those now existing.

I have the honor to be, Sir,

Your obedient servant,

E. B. SHUTTLEWORTH.

REPORT ON BACTERIOLOGICAL WORK IN CONNECTION WITH DIPHTHERIA.

November 1st, 1899.

Charles Sheard, Esq., M.D., Medical Health Officer, Toronto.

Sir,—I beg leave to submit the following report of bacteriological work carried on in connection with the Isolation Hospital, and also as applied to the diagnosis of doubtful cases of diphtheria occurring in the practice of city physicians.

Hospital Admission by Bacteriological Diagnosis.—There were 298 cases of clinically diagnosed diphtheria admitted to the Hospital during the official year. The application of the bacteriological test resulted in the demonstration of the fact that 238, or 79.87 per

cent. were genuine, and 60, or 20.13 per cent. were not cases of true diphtheria, but generally tonsillitis, or other condition of the mucous membrane, attended by an exudate, and with pyrexia, but in which the organism characteristic of diphtheria was not present.

In many cases it appears to be absolutely impossible for the clinician, no matter how skilful or experienced, to determine, by ordinary signs, whether he has to deal with diphtheria, or those affections which so closely simulate it. The exudate in follicular tonsillitis, in which streptococci, or staphylococci, or both, are commonly present, is often deceptive, but the main difficulty is with those cases in which a more or less tough, adherent, parchment-like membrane is formed. Ample opportunity has been afforded to observe such membrane, by inspection in situ, and also when detached, and there can be no doubt but that staphylococci, streptococci, and certain saccharomyces, particularly the latter, are capable of causing the formation of a membrane which to the unaided eye cannot be distinguished from that occasioned by the presence of the diphtheria bacillus.

Before the advent of bacteriology such membranes would have been properly classed as diphtheria, but if the recognized modern restriction be observed in regard to the application of the term diphtheria, these cases in which the Klebs-Loeffler bacillus is absent must, of course, be rejected. As far as concerns such institutions as the Isolation Hospital it is well that this dissociation has taken place, as neither in infectiveness, duration, severity, nor mortality can false and true diphtheria be compared, and it does not seem that the former has any claim to treatment in hospitals of a special class.

These negative cases, who are discharged as soon as the character of the disease is ascertained, usually in two or three days, have diminished slightly, being 20.1 per cent. against 22.2 per cent. in 1898, and 21.6 per cent. in 1897.

Diagnosis of City Cases.—632 exudates were sent in by city physicians during the year. This number is largely in excess of last year, and the proportion of negative cases—60.6 per cent.—is also greater, indicating a more extensive and freer use of the resources of the city laboratory.

Hospital Discharge by Bacteriological Diagnosis.—This method has continued to give satisfactory results. There has only been one

probable return case—No. 4161—from houses to which discharged diphtheria patients have been sent, and diphtheria has not developed in any of the discharged negative cases, nor, as far as known, in any of their homes.

Duration of Hospital Term.—Of the 238 non-fatal cases of clinically diagnosed diphtheria the average stay in hospital was 19.44 days, practically identical with the term in 1898, when it was 19.55 days, and against 26.3 days prior to 1894, when the discharge was determined by clinical methods. The saving of time, both to hospital and patient, showed an average of 6.9 days per patient.

In cases of true diphtheria, as bacteriologically proved, the average detention was 23.9 days, against 24.5 days last year. The negative cases, mainly tonsillitis, were disposed of in 3.7 days. It would be possible to discharge these patients in even a shorter period of time, but this would be attended with some risk, and it is considered best to make a confirmatory test, thus requiring the expenditure of another day. Of the fatal cases of diphtheria the result was reached in an average of 3.4 days after admission.

The period of hospital detention seems to be somewhat affected by season, being unfavorably affected by warm weather. During the months of July, August, and September, the average term was 28.4 days, while for the balance of the year, representing low and moderate temperatures, the attack lasted for an average of 22.7 days.

Persistence of Bacilli.—Last year there were 18 cases in which the bacilli did not disappear from the throats of the patients until after the lapse of over 42 days. This year there were 18 cases of a similar kind, the duration of the disease showing two cases for 42 days; 2 for 43; 4 for 44; 4 for 45; and one each at 52, 53, 54, 56, 59, and 68 days. In most of these cases the membrane had disappeared for many weeks, the only clinical evidence of the presence of infection being a more or less congested condition of the mucous membrane of the throat, or nasal passages, or perhaps a slight discharge from the ears. It is quite possible for infection to remain in the throat without any marked effect being apparent in the mucous membrane, yet, as has been satisfactorily demonstrated, the bacilli, which have seemingly lost their power of affecting their host, are capable of infecting new material and regaining their virulence. Whether in these old cases the lack of effect is due to acquired im-

munity on the part of the patient, or loss of virulence, or power of producing toxin on the part of the bacillus, has not been determined, but it is certain that this source of infection is that which is most to be dreaded, as its existence is unknown to those who bear it, and unrecognized by others, so that there is an unconscious and often generous sowing of seed and receptivity of soil, particularly on the part of females and little children, to whom close contact and osculatory demonstrations seem indispensable evidences of affection.

It fortunately happens that there is some equivalent for these cases of protracted infection. In a few instances the bacilli may disappear in less than a week. Thus there was during the year one case in which the period was only five days, and three in which the micro-organism only persisted for a week, and in another instance for nine days. All these were patients who were over 14 years of age. As a general rule the shortest averages were made by the laryngeal cases—say two or three weeks—and the longest by those in which the nasal membranes were involved.

Susceptibility as Influenced by Age.—Of the 238 cases of true diphtheria the ages were as follows:—

5 years and under	32.6 per cent.
5 years to 10 years	29.6 per cent.
10 years to 15 years	12.7 per cent.
Over 15 years	25.0 per cent.

The oft repeated statement that children under five years of age are more susceptible than during any other quinquennial period again receives confirmation. This was not however the case last year, as the second period showed the greatest liability, but, of the 1,000 cases tabulated in 1897, the predominance was with the earlier ages. Different years afford different results, and it is evident that either the character of the disease, or its subjects, change in this respect, or that the statistics of a year afford insufficient data.

I am inclined to think that the former is the case, and that certain unknown conditions operate in deciding liability to attack at certain ages. In 1898 the increased receptivity of persons over 15 years of age was very evident, and this was also the case last year when the percentage—25—was precisely the same. Of the 1,000 cases tabulated up to 1897 the percentage was 19.9, while in England, the 1,000 cases cited by Lennox Browne showed 17.8 per cent.

While recognizing the fact that the statistics of different years are not uniform, it is possible to get an idea of the general average result, and I have therefore added 500 cases to the 1,000 tabulated in 1897, and in this way am enabled to present the following figures:—

Under 5 years	31.4 per cent.
5 to 10 years	33.8 per cent.
10 years to 15 years	12.5 per cent.
Over 15 years	22.3 per cent.

Susceptibility as Influenced by Sex.—Of cases of true diphtheria the proportion of males to females was as 42.01 to 57.99 per cent. During the time covered by the statistics of the Isolation Hospital there has always been a preponderance of female cases, and in a fairly constant proportion. The aggregate per centages of the past five years show the proportion to be 42.90 to 56.93. I think it may be recognized as an established fact, applicable here and elsewhere, that females are more liable to diphtheria than are males, and that in Toronto this may be represented by the ratio of about 57 to 43.

Mortality in True Diphtheria.—Of the 238 patients who were shown by bacteriological test to be suffering from true diphtheria there were 36 fatal cases, or 15.12 per cent., as compared with 11.5 per cent. last year. This is largely due to the increase of moribund cases admitted—14 against 6. If those be excluded the corrected or net mortality is 9.24 per cent., being practically identical with the figures for the previous period.

Hospital Mortality.—Among the 298 patients admitted clinically for diphtheria there were 37 deaths, or 12.41 per cent. This may be styled the gross hospital mortality. A number of these cases were moribund when admitted, and it is customary in compiling hospital statistics to exclude cases which prove fatal within 24 hours after admission, thus giving the net hospital mortality, on which comparisons of hospital treatment may be justly based. There were 14 such moribund cases, in which death supervened in less than twenty hours, and in 8 of them in less than 5 hours, the average of the whole being 8.8. hours. A correction on this basis brings the net hospital mortality down to 7.38 per cent.

Mortality as Influenced by Age.—Although there was not a great difference in the number of cases of true diphtheria in the first

two quinquennial periods, the mortality in the class under 5 years was, as usual, immensely greater than in the next oldest class.

The following comparative statement of mortality at various periods admits of a fairly definite conclusion in regard to the influence of age:—

	Deaths.	per cent.	per cent.	per cent.
	1899	1899	1898	1897
Under 5 years	24	66.6	53.4	62.5
5 years to 10 years	5	13.9	30.4	28.1
10 years to 15 years	3	8.3	13.3	3.1
Over 15 years	4	11.1	3.3	6.2

Mortality as Influenced by Sex.—Of the 238 cases of true diphtheria there were 100 males, of whom 14, or 14.0 per cent. died. Among the 138 females there were 22 deaths, equalling 15.9 per cent.

Relation between Mortality and Character of Disease.—Over one-third—36 per cent.—of the total deaths resulted in purely laryngeal cases. Laryngo-pharyngeal and laryngo-naso-pharyngeal diphtheria each showed a mortality of 14 per cent., and in naso-pharyngeal and pharyngeal there were respectively 30 and 5 per cent. These percentages are calculated from the number of deaths, and really do not do more than indicate the true state of the case. As a matter of fact, the laryngeal cases admitted to the hospital were comparatively few when compared with those in which the pharynx was affected, and yet among the former there was by far the greater number of deaths. The disease is particularly fatal when the nasal membranes and larynx are affected, and this doubtless arises from the difficulty and risk involved in reaching these parts by antiseptic applications, and also from the ready absorption of toxin, more particularly by the nasal passages.

Complications in Fatal Cases.—Twenty-eight of the thirty-six fatal cases were without complications. Of the remainder there were four with broncho-pneumonia, 2 with measles and broncho-pneumonia, and one with meningitis and chronic Bright's disease.

Mortality in Cases of Throat Disease other than Diphtheria.—For the first time since I have had supervision of hospital statistics has there been a death from mere tonsillitis. This occurred in case

No. 3,663, a female child, aged five, who was admitted for diphtheria. There was much cellulitis, and a swab was obtained with difficulty. On culture this showed yeast only. The patient died in about 36 hours. A good postmortem swab was taken, which, however, on culture, only gave the golden staphylococcus and the streptococcus pyogenes.

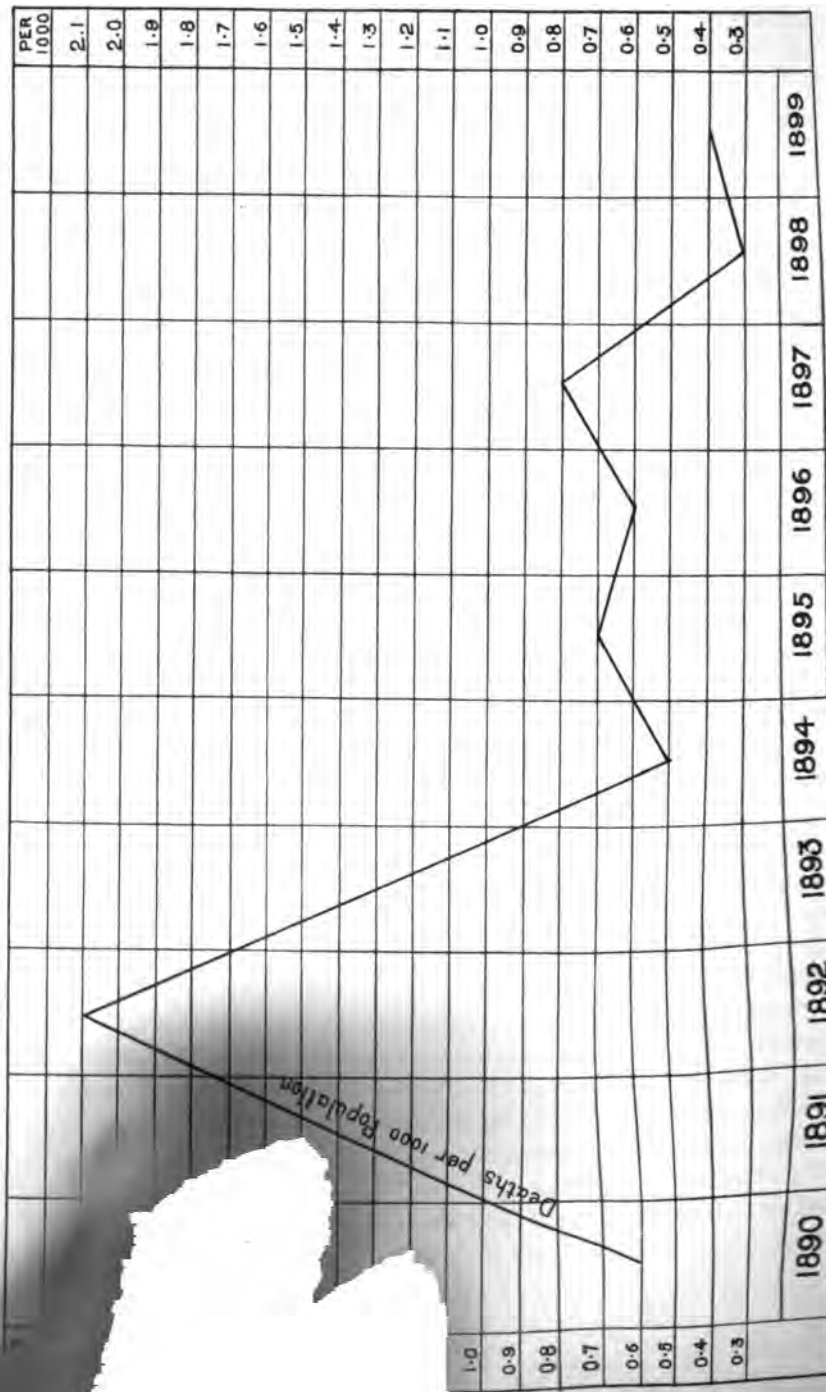
General Mortality of Clinically Diagnosed Diphtheria in Toronto.—The annual reports of the Registrar-General of Ontario give the numbers of those who die of diphtheria, while the statistics of the Local Board of Health furnish a record of the cases reported. From these data it is therefore possible to get an idea of the mortality, but it must be remembered that while all the deaths are undoubtedly registered, the cases are not so faithfully reported, and, as a consequence, the percentage of deaths to cases will appear higher than it really is. The Hospital records are complete since its commencement in November 1891, and afford a perfectly reliable means of estimating the mortality of diphtheria, subject, however, to the reservation that the cases sent to the Hospital are, in general, more severe in type than those treated at home.

In the table appended I have given a comparative mortality statement covering eight years, from 1892 to 1899 inclusive, and the subject is further elucidated by a plotted diagram showing the percentage of deaths to cases, both in the Hospital and in the City generally.

In regard to the statement of mortality rates at the Isolation Hospital it is necessary for me to explain that if a comparison is made of the figures of various years as appearing in this and other reports, there are apparent discrepancies arising from the fact that the Hospital year, which governs the report of the Superintendent, ends on November 22nd. My reports have heretofore been made up to June 30th, and the Registrar-General's returns are completed to December 31st. The annual terms are not coincident, but in the following table I have made them so in order that the data may be used for purposes of comparison.

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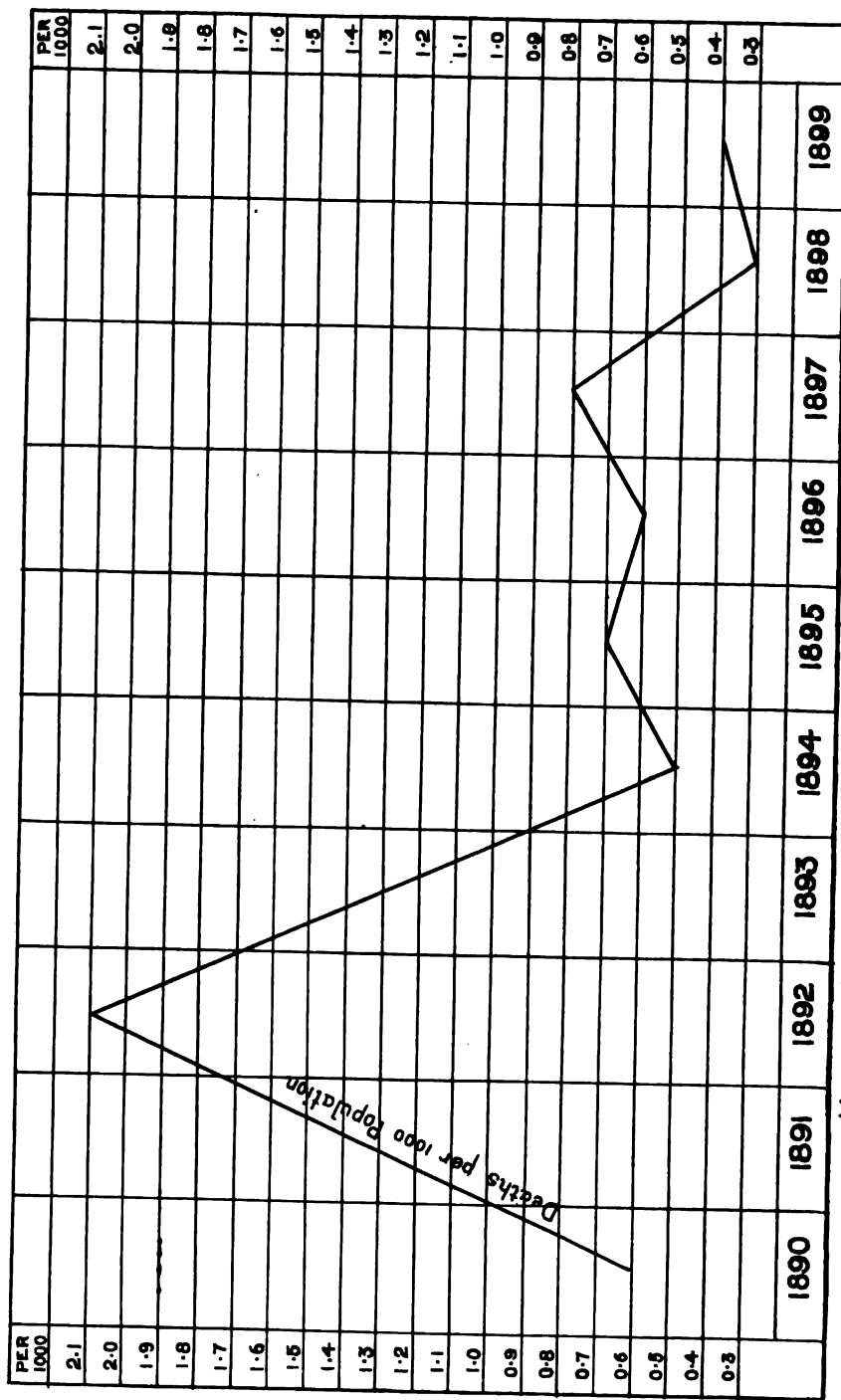


Mortality from Diphtheria in Toronto in rate per 1000 Population.

Cases and Deaths from Diphtheria occurring in the City generally, and in the Isolation Hospital from 1892 to 1899, inclusive.

Year.	City Cases			Hospital Cases.		
	Cases Reported.	Deaths Registered.	Per Cent- age : Deaths to Cases.	Cases Reported.	Deaths Registered.	Per Cent- age : Deaths to Cases.
1892	1,625	387	23.8	629	91	14.4
1893	583	253	43.3	289	62	20.7
1894	338	110	32.5	193	29	15.0
1895	506	147	29.0	389	60	15.4
1896	562	132	23.5	357	61	17.0
1897	719	161	22.3	425	59	13.7
1898	426	63	14.7	272	27	9.9
1899	501	89	17.7	346	44	12.7
	5,260	1,725	25.5	2,900	433	14.9

Death-rate as Calculated on a Population Basis.—As it is nearly nine years since the census was taken, the population of Toronto can only be estimated. The figures given in the annual reports of the Registrar-General are obtained by adding one per cent. annually to the population of the previous year. This has been found to cover, with reasonable accuracy, the balance between deaths and births in the Province of Ontario generally, but is not equally applicable to some cities, as Toronto, the population of which increases largely from outside accessions. The Registrar-General places the population for 1899 at 201,916, but this is undoubtedly much under the mark. The publisher of the "City Directory, 1900," says that there are included in that work 87,029 names. In order to estimate population from such data it is usual to multiply by three, or even by four; but with a multiple as low as two and seven-eighths, the number of persons in Toronto is shown to be as high as 250,209. In the diagram of deaths per 1,000 for the last ten years, I have used the Registrar-General's figures, as they have been adopted by the Provincial Board of Health. The proportion of deaths is doubtless much too high, probably in about the ratio indicated by the above statements as to population. The range is between 0.3 per 1,000 in 1898, to 2.1 in 1892, with an average of 0.87 as calculated for ten years. The rate is very largely influenced by the figures for 1891-2-3, when disease was very prevalent, and for part of the time very virulent.



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Degree of Virulence as Indicated by Mortality.—In order to determine the degree of virulence of the disease prevailing at any particular time, the death rate per 1,000 may be utilized, but cannot be wholly depended upon, as it is affected not only by the severity of the disease, but also by its prevalence; that is, during some years there may be numerous cases of a comparative mild type, and, in others, fewer cases of a very severe character. For the estimate of virulence the per centage of deaths to cases is the most reliable method, and with complete statistics, is wholly so. Those of the Isolation Hospital may be accepted as fairly trustworthy, though giving results a trifle too high, as resulting from a cause previously explained, and also from the fact that a considerable proportion of the patients are moribund when admitted. However, it is likely that different years are in this respect more or less alike, and for comparative purposes such data are quite admissible.

In the accompanying diagram the per centage of deaths to cases is shown with reference to the Isolation Hospital as well as the City generally—the latter including the former. The figures thus obtained are interesting, not only in demonstrating the subject under discussion, but also in some degree indicating the difference in the result of hospital and home treatment of the disease.

An inspection of this diagram reveals the fact that during the past eight years the virulence of diphtheria has varied very considerably. In 1892, when the disease was most prevalent, the type was somewhat mild, the hospital mortality being 14.4 per cent. of the cases. In 1893 the disease became much more severe, but the number of cases declined to about one-third of that of the year preceding. During 1894 there was a reduction in virulence to about the same degree as in 1892, and this continued, practically nearly constant through 1895, with a rise of 2 per cent. in 1896. In the next year there was a considerable rise in frequency and a decline in mortality to a point slightly lower than that of 1892. This state of things continued during the year, but in 1898 there was a sharp fall in frequency and mortality, the latter declining to a point—10 per cent.—lower than shown by any previous record. During 1899 there was a slightly increasing number of cases of a somewhat more virulent type, both however happily well below the mean line.

It has been asserted that the decline in virulence in both city and hospital cases during 1896-7-8 was due to the introduction of



Percentage of Deaths in Hospital & City cases of Diphtheria.

probable return case—No. 4161—from houses to which discharged diphtheria patients have been sent, and diphtheria has not developed in any of the discharged negative cases, nor, as far as known, in any of their homes.

Duration of Hospital Term.—Of the 238 non-fatal cases of clinically diagnosed diphtheria the average stay in hospital was 19.44 days, practically identical with the term in 1898, when it was 19.55 days, and against 26.3 days prior to 1894, when the discharge was determined by clinical methods. The saving of time, both to hospital and patient, showed an average of 6.9 days per patient.

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The period of hospital detention seems to be somewhat affected by season, being unfavorably affected by warm weather. During the months of July, August, and September, the average term was 28.4 days, while for the balance of the year, representing low and moderate temperatures, the attack lasted for an average of 22.7 days.

Persistence of Bacilli.—Last year there were 18 cases in which the bacilli did not disappear from the throats of the patients until after the lapse of over 42 days. This year there were 18 cases of a similar kind, the duration of the disease showing two cases for 42 days; 2 for 43; 4 for 44; 4 for 45; and one each at 52, 53, 54, 56, 59, and 68 days. In most of these cases the membrane had disappeared for many weeks, the only clinical evidence of the presence of infection being a more or less congested condition of the mucous membrane of the throat, or nasal passages, or perhaps a slight discharge from the ears. It is quite possible for infection to remain in the throat without any marked effect being apparent in the mucous membrane, yet, as has been satisfactorily demonstrated, the bacilli, which have seemingly lost their power of affecting their host, are capable of infecting new material and regaining their virulence. Whether in these old cases the lack of effect is due to acquired im-

munity on the part of the patient, or loss of virulence, or power of producing toxin on the part of the bacillus, has not been determined, but it is certain that this source of infection is that which is most to be dreaded, as its existence is unknown to those who bear it, and unrecognized by others, so that there is an unconscious and often generous sowing of seed and receptivity of soil, particularly on the part of females and little children, to whom close contact and osculatory demonstrations seem indispensable evidences of affection.

It fortunately happens that there is some equivalent for these cases of protracted infection. In a few instances the bacilli may disappear in less than a week. Thus there was during the year one case in which the period was only five days, and three in which the micro-organism only persisted for a week, and in another instance for nine days. All these were patients who were over 14 years of age. As a general rule the shortest averages were made by the laryngeal cases—say two or three weeks—and the longest by those in which the nasal membranes were involved.

Susceptibility as Influenced by Age.—Of the 238 cases of true diphtheria the ages were as follows:—

5 years and under	32.6 per cent.
5 years to 10 years	29.6 per cent.
10 years to 15 years	12.7 per cent.
Over 15 years	25.0 per cent.

The oft repeated statement that children under five years of age are more susceptible than during any other quinquennial period again receives confirmation. This was not however the case last year, as the second period showed the greatest liability, but, of the 1,000 cases tabulated in 1897, the predominance was with the earlier ages. Different years afford different results, and it is evident that either the character of the disease, or its subjects, change in this respect, or that the statistics of a year afford insufficient data.

I am inclined to think that the former is the case, and that certain unknown conditions operate in deciding liability to attack at certain ages. In 1898 the increased receptivity of persons over 15 years of age was very evident, and this was also the case last year when the percentage—25—was precisely the same. Of the 1,000 cases tabulated up to 1897 the percentage was 19.9, while in England, the 1,000 cases cited by Lennox Browne showed 17.8 per cent.

While recognizing the fact that the statistics of different years are not uniform, it is possible to get an idea of the general average result, and I have therefore added 500 cases to the 1,000 tabulated in 1897, and in this way am enabled to present the following figures:—

Under 5 years	31.4 per cent.
5 to 10 years	33.8 per cent.
10 years to 15 years	12.5 per cent.
Over 15 years	22.3 per cent.

Susceptibility as Influenced by Sex.—Of cases of true diphtheria the proportion of males to females was as 42.01 to 57.99 per cent. During the time covered by the statistics of the Isolation Hospital there has always been a preponderance of female cases, and in a fairly constant proportion. The aggregate per centages of the past five years show the proportion to be 42.90 to 56.93. I think it may be recognized as an established fact, applicable here and elsewhere, that females are more liable to diphtheria than are males, and that in Toronto this may be represented by the ratio of about 57 to 43.

Mortality in True Diphtheria.—Of the 238 patients who were shown by bacteriological test to be suffering from true diphtheria there were 36 fatal cases, or 15.12 per cent., as compared with 11.5 per cent. last year. This is largely due to the increase of moribund cases admitted—14 against 6. If those be excluded the corrected or net mortality is 9.24 per cent., being practically identical with the figures for the previous period.

Hospital Mortality.—Among the 298 patients admitted clinically for diphtheria there were 37 deaths, or 12.41 per cent. This may be styled the gross hospital mortality. A number of these cases were moribund when admitted, and it is customary in compiling hospital statistics to exclude cases which prove fatal within 24 hours after admission, thus giving the net hospital mortality, on which comparisons of hospital treatment may be justly based. There were 14 such moribund cases, in which death supervened in less than twenty hours, and in 8 of them in less than 5 hours, the average of the whole being 8.8. hours. A correction on this basis brings the net hospital mortality down to 7.38 per cent.

Mortality as Influenced by Age.—Although there was not a great difference in the number of cases of true diphtheria in the first

two quinquennial periods, the mortality in the class under 5 years was, as usual, immensely greater than in the next oldest class.

The following comparative statement of mortality at various periods admits of a fairly definite conclusion in regard to the influence of age:—

	Deaths.	per cent.	per cent.	per cent.
	1899	1899	1898	1897
Under 5 years	24	66.6	53.4	62.5
5 years to 10 years	5	13.9	30.4	28.1
10 years to 15 years	3	8.3	13.3	3.1
Over 15 years	4	11.1	3.3	6.2

Mortality as Influenced by Sex.—Of the 238 cases of true diphtheria there were 100 males, of whom 14, or 14.0 per cent. died. Among the 138 females there were 22 deaths, equalling 15.9 per cent.

Relation between Mortality and Character of Disease.—Over one-third—36 per cent.—of the total deaths resulted in purely laryngeal cases. Laryngo-pharyngeal and laryngo-naso-pharyngeal diphtheria each showed a mortality of 14 per cent., and in naso-pharyngeal and pharyngeal there were respectively 30 and 5 per cent. These percentages are calculated from the number of deaths, and really do not do more than indicate the true state of the case. As a matter of fact, the laryngeal cases admitted to the hospital were comparatively few when compared with those in which the pharynx was affected, and yet among the former there was by far the greater number of deaths. The disease is particularly fatal when the nasal membranes and larynx are affected, and this doubtless arises from the difficulty and risk involved in reaching these parts by antiseptic applications, and also from the ready absorption of toxin, more particularly by the nasal passages.

Complications in Fatal Cases.—Twenty-eight of the thirty-six fatal cases were without complications. Of the remainder there were four with broncho-pneumonia, 2 with measles and broncho-pneumonia, and one with meningitis and chronic Bright's disease.

Mortality in Cases of Throat Disease other than Diphtheria.—For the first time since I have had supervision of hospital statistics has there been a death from mere tonsillitis. This occurred in case

No. 3,663, a female child, aged five, who was admitted for diphtheria. There was much cellulitis, and a swab was obtained with difficulty. On culture this showed yeast only. The patient died in about 36 hours. A good postmortem swab was taken, which, however, on culture, only gave the golden staphylococcus and the streptococcus pyogenes.

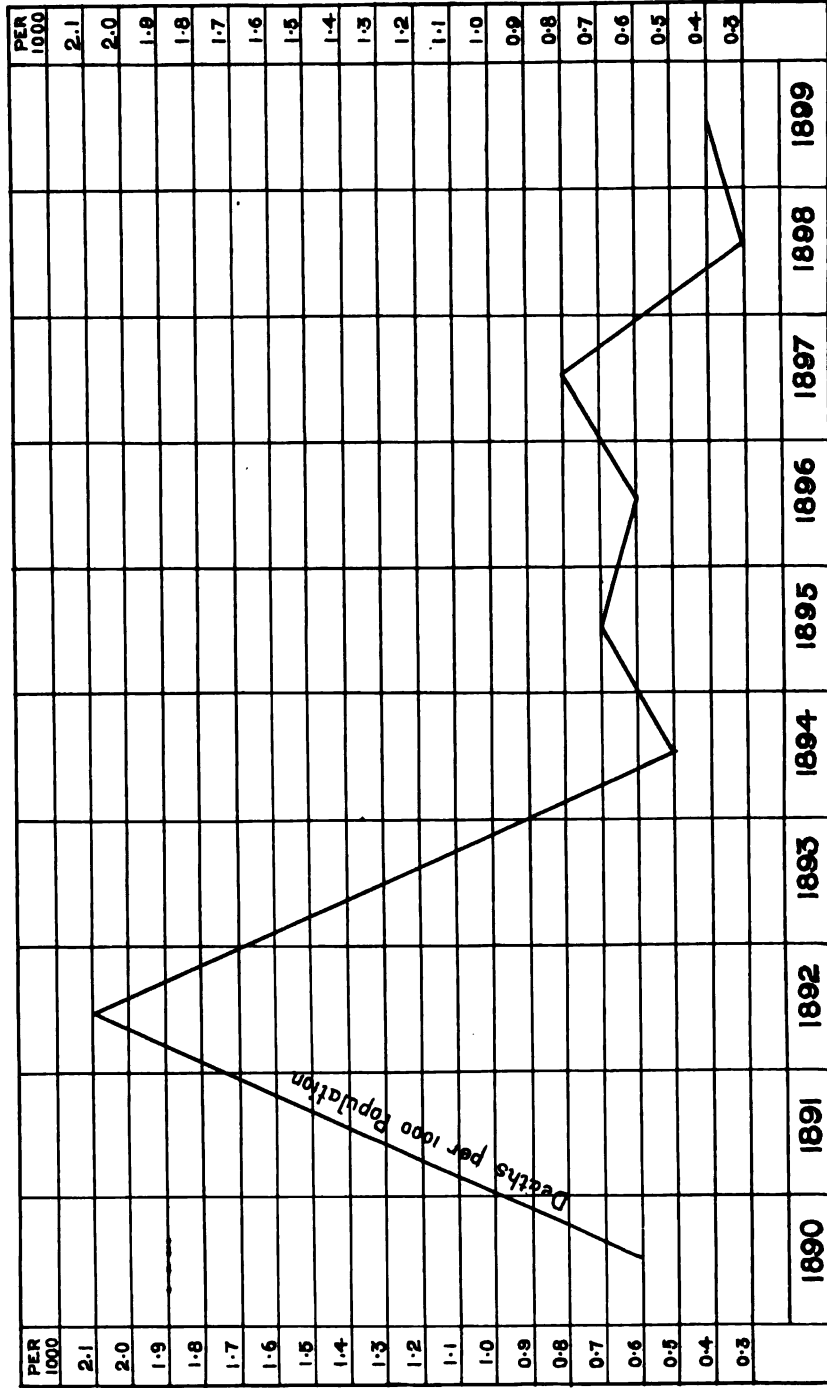
General Mortality of Clinically Diagnosed Diphtheria in Toronto.—The annual reports of the Registrar-General of Ontario give the numbers of those who die of diphtheria, while the statistics of the Local Board of Health furnish a record of the cases reported. From these data it is therefore possible to get an idea of the mortality, but it must be remembered that while all the deaths are undoubtedly registered, the cases are not so faithfully reported, and, as a consequence, the percentage of deaths to cases will appear higher than it really is. The Hospital records are complete since its commencement in November 1891, and afford a perfectly reliable means of estimating the mortality of diphtheria, subject, however, to the reservation that the cases sent to the Hospital are, in general, more severe in type than those treated at home.

In the table appended I have given a comparative mortality statement covering eight years, from 1892 to 1899 inclusive, and the subject is further elucidated by a plotted diagram showing the percentage of deaths to cases, both in the Hospital and in the City generally.

In regard to the statement of mortality rates at the Isolation Hospital it is necessary for me to explain that if a comparison is made of the figures of various years as appearing in this and other reports, there are apparent discrepancies arising from the fact that the Hospital year, which governs the report of the Superintendent, ends on November 22nd. My reports have heretofore been made up to June 30th, and the Registrar-General's returns are completed to December 31st. The annual terms are not coincident, but in the following table I have made them so in order that the data may be used for purposes of comparison.

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Mortality from Diphtheria in Toronto in rate per 1000 Population.

Cases and Deaths from Diphtheria occurring in the City generally, and in the Isolation Hospital from 1892 to 1899, inclusive.

Year.	City Cases			Hospital Cases.		
	Cases Reported.	Deaths Registered.	Per Cent- age : Deaths to Cases.	Cases Reported.	Deaths Registered.	Per Cent- age : Deaths to Cases.
1892	1,625	387	23.8	629	91	14.4
1893	583	253	43.3	289	62	20.7
1894	338	110	32.5	193	29	15.0
1895	506	147	29.0	389	60	15.4
1896	562	132	23.5	357	61	17.0
1897	719	161	22.3	425	59	13.7
1898	426	63	14.7	272	27	9.9
1899	501	89	17.7	346	44	12.7
	5,260	1,725	25.5	2,900	433	14.9

Death-rate as Calculated on a Population Basis.—As it is nearly nine years since the census was taken, the population of Toronto can only be estimated. The figures given in the annual reports of the Registrar-General are obtained by adding one per cent. annually to the population of the previous year. This has been found to cover, with reasonable accuracy, the balance between deaths and births in the Province of Ontario generally, but is not equally applicable to some cities, as Toronto, the population of which increases largely from outside accessions. The Registrar-General places the population for 1899 at 201,916, but this is undoubtedly much under the mark. The publisher of the "City Directory, 1900," says that there are included in that work 87,029 names. In order to estimate population from such data it is usual to multiply by three, or even by four; but with a multiple as low as two and seven-eighths, the number of persons in Toronto is shown to be as high as 250,209. In the diagram of deaths per 1,000 for the last ten years, I have used the Registrar-General's figures, as they have been adopted by the Provincial Board of Health. The proportion of deaths is doubtless much too high, probably in about the ratio indicated by the above statements as to population. The range is between 0.3 per 1,000 in 1898, to 2.1 in 1892, with an average of 0.87 as calculated for ten years. The rate is very largely influenced by the figures for 1891-2-3, when the disease was very prevalent, and for part of the time very virulent.

Degree of Virulence as Indicated by Mortality.—In order to determine the degree of virulence of the disease prevailing at any particular time, the death rate per 1,000 may be utilized, but cannot be wholly depended upon, as it is affected not only by the severity of the disease, but also by its prevalence; that is, during some years there may be numerous cases of a comparative mild type, and, in others, fewer cases of a very severe character. For the estimate of virulence the per centage of deaths to cases is the most reliable method, and with complete statistics, is wholly so. Those of the Isolation Hospital may be accepted as fairly trustworthy, though giving results a trifle too high, as resulting from a cause previously explained, and also from the fact that a considerable proportion of the patients are moribund when admitted. However, it is likely that different years are in this respect more or less alike, and for comparative purposes such data are quite admissible.

In the accompanying diagram the per centage of deaths to cases is shown with reference to the Isolation Hospital as well as the City generally—the latter including the former. The figures thus obtained are interesting, not only in demonstrating the subject under discussion, but also in some degree indicating the difference in the result of hospital and home treatment of the disease.

An inspection of this diagram reveals the fact that during the past eight years the virulence of diphtheria has varied very considerably. In 1892, when the disease was most prevalent, the type was somewhat mild, the hospital mortality being 14.4 per cent. of the cases. In 1893 the disease became much more severe, but the number of cases declined to about one-third of that of the year preceding. During 1894 there was a reduction in virulence to about the same degree as in 1892, and this continued, practically nearly constant through 1895, with a rise of 2 per cent. in 1896. In the next year there was a considerable rise in frequency and a decline in mortality to a point slightly lower than that of 1892. This state of things continued during the year, but in 1898 there was a sharp fall in frequency and mortality, the latter declining to a point—10 per cent.—lower than shown by any previous record. During 1899 there was a slightly increasing number of cases of a somewhat more virulent type, both however happily well below the mean line.

It has been asserted that the decline in virulence in both city and hospital cases during 1896-7-8 was due to the introduction of



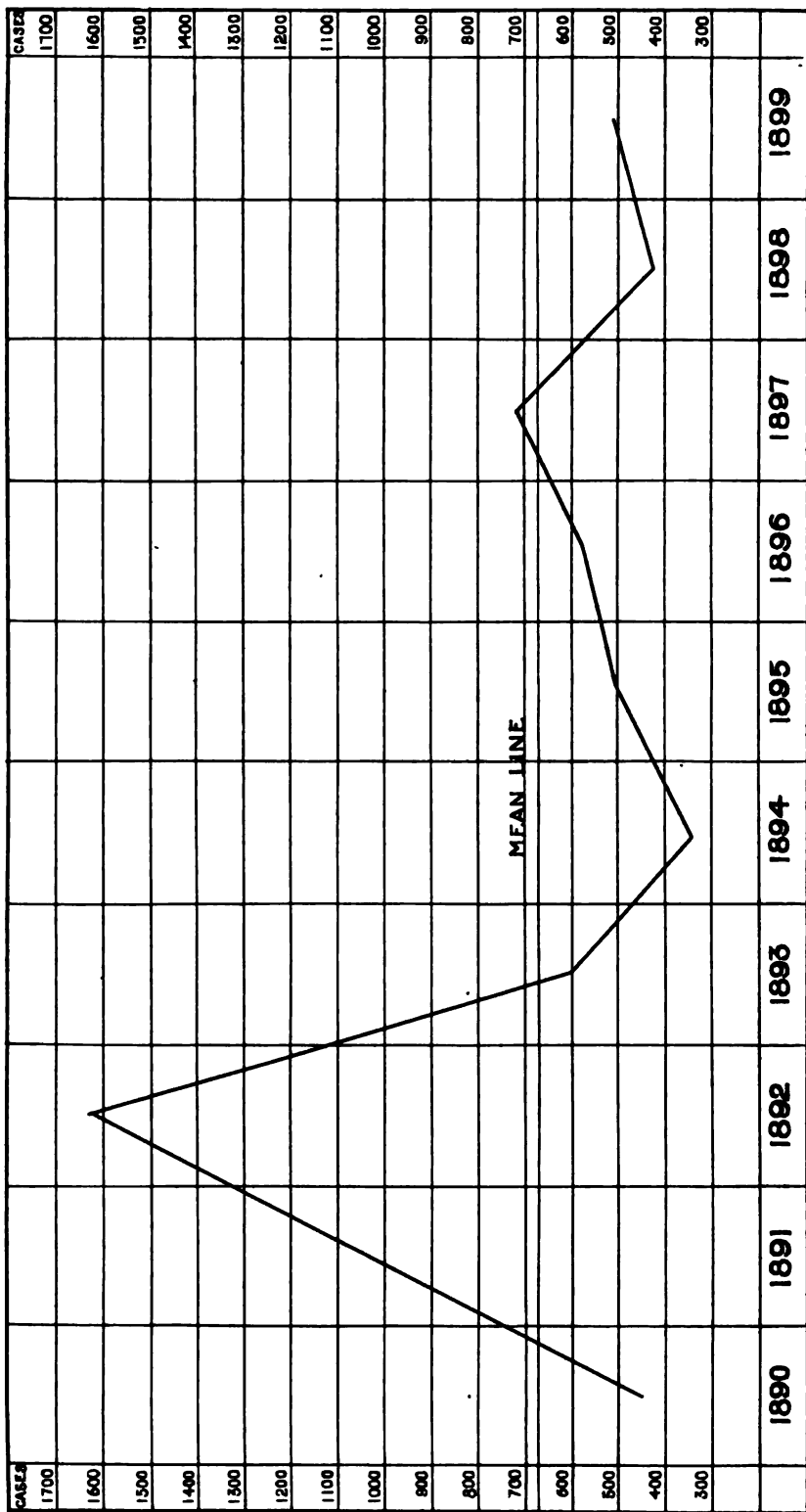
Percentage of Deaths in Hospital & City cases of Diphtheria.

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Occurrence of Diphtheria as shown by Reported Cases.

antitoxin. A little investigation shows that this conclusion is quite unjustifiable. From 1893 to 1895, when, in this city at least, antitoxin was little more than an experiment, the mortality declined from 43.3 to 29.0 per cent. for City cases, and from 20.7 to 15.4 per cent. for those in Hospital. It is reasonable to ascribe to the same natural cause, rather than to any new influence, the decline in virulence during 1897 and 1898. Again, in both City and Hospital cases there was a mortality of three per cent. over the year preceding, while antitoxin had been more generally used by city physicians. In 1898, when the mortality was at its lowest in the Isolation Hospital, there was not a single dose of antitoxin administered, while last year half the patients under ten years of age, 113 in all, were so treated. The records show a marked increase in the death rate, but, without other proof, it would be almost as unreasonable to charge this against antitoxin treatment, as to credit it with the previous decline.

Scarlet fever, a disease closely related to diphtheria, shows even more strongly marked variation in virulence. Thus it reached its highest development—20 per cent. mortality in 1893; fell to one-eighth of this in 1896, since which it has been doubled and declined twice. Last year, as in the case of diphtheria, it became rather more severe in type, following closely the related disease. As a matter of fact the decrease in the virulence of scarlet fever during the period under review, has been more marked than in the case of diphtheria. This has resulted from unknown but admitted natural causes in which the advocates of the serum treatment can claim no part, but had there been a scarlatinal antitoxin it would doubtless have had the credit.

Occurrence of Diphtheria.—The occurrence of diphtheria in Toronto, as evidenced by reported cases, is plotted on an accompanying diagram, giving the records of ten years. This diagram has been previously referred to and explains itself. It may, however, be mentioned that the mean line represents 673 cases annually, and any number less than this shows an improvement on the average of ten years.

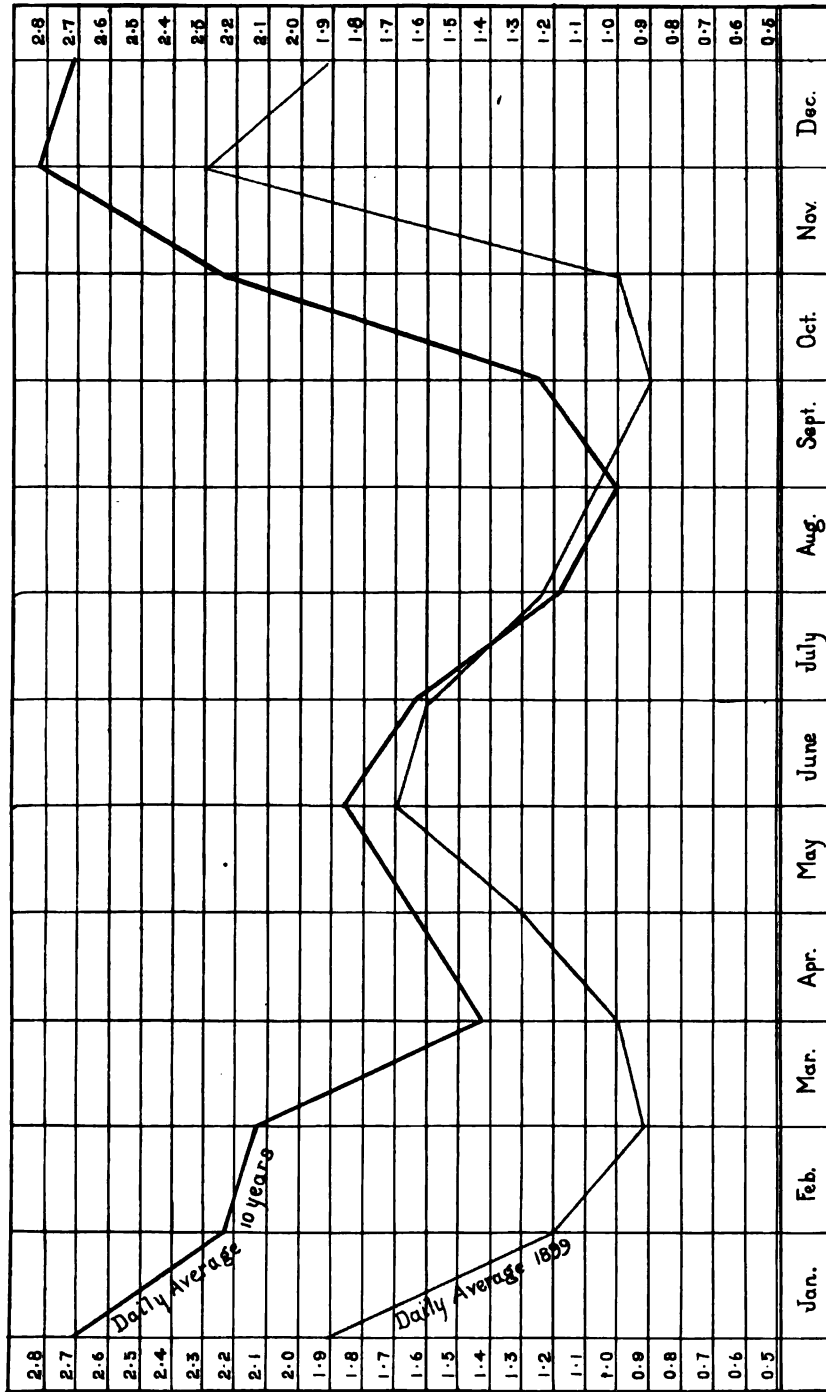
Seasonal Occurrence of Diphtheria.—I have also represented this in diagrammatic form. The black line represents the daily average of cases occurring in each month, and is calculated from the figures of ten years. It will be seen that the disease reaches its

maxim in November and May, the former showing much the highest point. The lowest is in August. It is interesting to note how closely the daily averages for 1899—represented by the red line—follow the general average, affording confirmation of the reliability of the deductions made from the figures of the past decade.

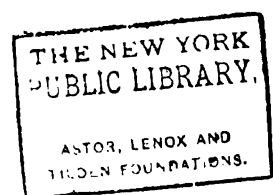
I have the honor to be, sir,

Your obedient servant,

E. B. SHUTTLEWORTH.



Monthly Occurrence of Diphtheria in Toronto in Daily Averages.



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